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ABSTRACT

Teachers' centers, the basics, computers, classroom management, and Educational Resources Information Center (ERIC) are topics of the sections of this collection of resource articles for teachers. The usefulness of this collection is not limited to Wyoming. In the section on teachers' centers are articles on the roles and responsibilities of teacher consultants (teachers who assist other teachers) and strategies for their success, profiles of Wyoming teacher consultants, brief recommendations for the professional development of teachers, and ideas for collecting inexpensive classroom materials. The "basics" section has research-based suggestions in question-and-answer format for improving pre-reading, reading and mathematics instruction; an opinion paper on the need to combine futurism with the basics; and methods, terminology and goals for futuring and future studies instruction. In the computers section are discussed the need for teachers to accept computers, the progress that has been made in Wyoming in computer literacy programs, and concepts that should be included in computer literacy programs. The articles in the classroom management section describe the characteristics and techniques of effective classroom managers, provide practical suggestions for discipline, and list brief classroom tips and motivation ideas. The document concludes with an explanation of ERIC and testimonials to its effectiveness. (DC)

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IRENE D. CLARKE

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Wyoming Teacher Resource Kit

and Caboodle

WYOMING TEACHERS' CENTER
2602 West E.
Torrington, Wyoming 82240

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THE WYOMING TEACHERS' CENTER STORY

In the beginning . . .

Or at least 10-15 years ago, the roots of the teacher centering idea began. Arnold Willems and Max Brown of the University of Wyoming, Laramie, both recognized its possibilities in November 1972, in their article, "The Teacher Center Assists In Resource Use," in *Educational Leadership*. Based on the belief that teachers best understand their own professional growth needs and will voluntarily participate in programs they build themselves, many kinds of teachers' centers grew up around the country. As varied as they were, what each had in common was a board primarily composed of classroom teachers, with a program built especially around teachers' concerns and needs.

Our focus centered quite naturally . . .

On the possibility of a teachers' center when the Wyoming Education Association (WEA) decided to broaden its professional development program.

Of course, there were already many agencies in the state successfully providing instruction and in-service to educators—school districts, the State Department of Education, community colleges, the University of Wyoming. For example, one level of need these agencies meet originates in state mandates, such as the three areas of credit all teachers must have by 1984: reading, exceptionality, and human relations. Another level is the district where inservice is directed at targets like curriculum development and integration of new programs into the schools.

By contrast, the teachers' center was meant to concentrate on the classroom level. Needs and concerns could parallel, mesh, or be very different from those at the other levels, but the specific focus was to be the individual teacher.

Our adventure began . . .

Late in 1979 when WEA contacted the State Department of Education and the University of Wyoming about submitting a proposal for a Federally funded state-wide teachers' center. Both agreed. Technical assistance was then provided by the Mid-continent Regional Educational Laboratory (McREL), which is funded by the National Institute of Education (NIE) and has Wyoming in its service area. Teachers were appointed by WEA to form the Policy Board to govern the Center with a broad-based teacher representation built in: Federal regulations require the governing board not only to have a majority of teachers, but educators from various levels—elementary, secondary, vocational, special education, and university along with an educational fiscal agent. With McREL's help, a proposal was drawn up and submitted in February, 1980, requesting a planning grant for an operational Center to begin functioning the following year. Although the proposal received a high rating in the selection process, Federal cuts in centers' allocations precluded funding that year.

We were on our way . . .

Because the Policy Board was optimistic about trying again. With McREL's assistance, they submitted another proposal by the February, 1981, deadline. The new one—an operational grant—was successfully funded in June, 1981, with final negotiations with Washington permitting an official start for the Wyoming Teachers' Center in August.

With a little help from our friends . . .

We successfully got off the ground. The efforts of these fine people made it possible:

1. the Goshen County School District for agreeing to be the fisal agent for the Project.
2. those who shared the cost of Policy Board meetings: the Wyoming Education Association, the State Department of Education, the University of Wyoming, and McREL.
3. the 12 members of the Teachers' Center Policy Board:
   Bob Leinius, secondary teacher, Cheyenne, Chairman
   Paul Novak, Assistant Superintendent, Torrington
   Judy Lissman, elementary teacher, Huntley
   Jane Smith, elementary teacher, Lingle
   Janet Philp, secondary teacher, Shoshoni
   Ron Gray, elementary teacher, Cheyenne
   Pol Holt, secondary teacher, Douglas
   Louise Jackson, professor, University of Wyoming
   Ed Gunderson, special education teacher, Casper
   Stuart Tietz, principal, Cheyenne
   Kathy Smith, elementary teacher, Buffalo
   Bernardine Craft, counselor, Rock Springs.

We found you . . .

And that is the real reason for the Wyoming Teachers' Center—you and the teachers you reach. We hope that in your building you'll be an advocate for the teacher centering idea and the style of our Center—which is not to impose anything on teachers but to assess what they need and help them achieve it. Since the Wyoming Teachers' Center is state-wide, its goals are different from a center located in one school district and housed in a single building with local equipment, materials, and staff. We believe that the program designed by the Policy Board is especially fine because it depends on teachers like you to translate purpose into action all over Wyoming.

And they lived . . .

With the hope of reaching as many teachers as possible across the state through you, the 170 teachers we've trained in teacher consulting. We must live with the reality that we are only funded for this year with future teachers' center money included in the block grants to states and local districts. However that eventually works out, the Wyoming Teachers' Center will have been a worthwhile effort this year alone if we succeed in promoting the teacher centering idea so that educators and the public can see that centers, whatever form they take, are an effective way to impact student learning.

Thus, we look not to the end of what we've begun, but

The Beginning . . .

Irene Clarke, *Director*, Wyoming Teachers' Center

Wyoming Teachers' Center

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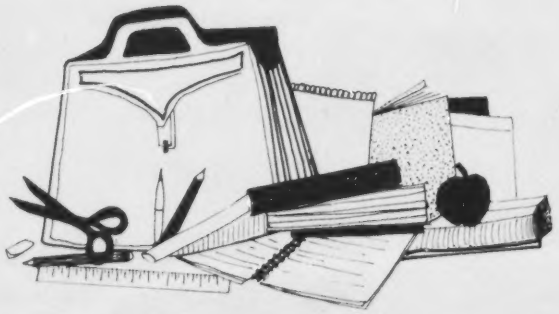
THE DO-IT-YOURSELF KIT OF TEACHER CONSULTING

by Gretchen Thomas

"Teacher consultants"—that phrase represents something special and new in Wyoming. If there's one in your building (and there probably is), you may wonder how they've been trained, what they're to do, how they'll fit into your school. The best way we know to explain the teacher consultant idea is to share a talk given by Gretchen Thomas from the Far West Laboratory for Educational Research and Development in San Francisco, to teachers being trained in teacher consulting at the Wyoming Teachers' Center.



When the Wyoming Teachers' Center Policy Board and Irene Clarke, the Center Director, told me about their plans for the Teacher Consultant Program, they said they wanted "in every school building in Wyoming a teacher available to talk with other teachers about their strengths, interests, problems, and concerns—someone with whom they can share their true feelings about their work."

What that comes down to, in my opinion, is a group of teachers making a commitment to support other teachers who want to grow—by providing a listening ear, a hand in planning, and a hook-up with resources, including teachers doing similar things.

What I have found from my work with the Teachers' Center Exchange and as a teacher consultant is the special way teacher consultants go about doing that—by respecting the work of teachers and trusting that they can decide for themselves how best to proceed. As one teachers' center director put it: "It's fairly easy to walk in and tell someone what to do. It's not too difficult to listen to a problem and say what you would do. But to listen to people and help them think through what is the next best step for them, that is quite a different way to work."

Common sense tells us why this is best—motivation is key to commitment. Research on staff development also supports the effectiveness of an approach that is informal, interactive, individualized, and serendipitous.

But, to really understand teacher consulting, it's essential to talk also of limits—to say not only what you are, but what you are *not*.

You are not the answer person, not the school re-organizer, not the principal's right hand, not the magician who re-energizes all the tired teachers and reaches the ones no one else can. You won't even be able to work with every teacher in the building. Moreover, you shouldn't try to do what is already being done by someone else in the school.

Basically, your stance is to find out what other teachers need and help *them* do it. That makes you a bouncer-offer, a clarifier, a focuser. You don't need to have an agenda—this isn't for you, it's for them. Listen for potential connections you can make between people. You don't have to be a very experienced person to do all this. In fact, often it's an advantage to be able to say, "I don't know, but we can find out" or "We can figure it out together."

Before you actually get started, though, assess the situation in your school—how this kind of work will be received and how it can best be introduced.

Don't rely completely on personal impressions of your school's readiness to accept the teacher consultant idea—sound out others. Anticipate possible resistances and hurt feelings. Be aware of anyone—including the principal—whose work or "territory" you may be crowding. For example, if there is a school psychologist, it may not be appropriate for you to help teachers with their special needs children. Or, if the principal views him/herself as the primary staff development person, be careful not to disturb this relationship. The same goes for people like the reading specialist, resource teacher, department head, etc.

Take a good look at what's already working in your school. Don't go against established lines of communication. If everyone's "meetinged-out," don't add more meetings. Remember that you're a Teachers' Center consultant. When people ask how the program would benefit them, you must be able to connect your explanation to their particular interests.

Balance is also important. A consultant should

Condensed from the Wyoming Teachers' Center Consultant Workshops.

not lean too heavily toward either teachers on the one hand or principals on the other. You need to be close enough to the principal to get problems solved, but not so close teachers will not see you as their advocate.

When you're ready to introduce the concept into your school, maintain that balance. Talk first with the principal. Describe the teacher consultant role and the work you'd like to do. Then, find an opportunity a few days later to check back to see what he/she thinks about it, how your role and his/hers coordinate. Keep having such conversations as the work progresses over time.

Directly contact those already mentioned whose work may appear to overlap with yours to introduce what you're doing and assure them you won't duplicate or interfere with their responsibilities.

Now you're ready to introduce the concept to everyone else in school. You may handle it formally or very informally. (Examples: Some consultants talked with each teacher individually. Others made a presentation at a meeting of the whole faculty. Many met several times with small groups—departments or grade levels, for example. Those who just started working without some kind of introduction or opportunity for discussion of their roles were sorry later.) Whatever the form of announcement—be sure it's made by *you* and not the principal. (However, if there's a message to the community, such as a news release, that should come from the principal.)

These first steps set the stage. At this point, it's important to pick something you enjoy that will help people play the kind of role and think about the kinds of things they'll do later as you work together. Some consultants wrote letters or put up posters describing typical projects/activities for teacher involvement. Others began with a materials exchange or children's work display. Still others got started with a sharing session/workshop on a school improvement or special interest topic.

If I were doing it today, I think I would arrange a curriculum, idea sharing, or brainstorming exercise with the whole faculty followed by a Wealth Assessment. (See Wealth Assessment box with article.) A note about use of the Wealth Assessment: don't ask people to fill it in themselves, it's essential that pairs of teachers interview each other. We'll tell others, or let them draw out of us, much more about ourselves than we'll write down. And, the more time people have, the more they'll think to add—so collect them at the very end of the meeting. I would end the meeting with a brief description of the teacher consultant concept and what work might take place—mentioning at this point only things you want to do and can do right away.

However you choose to present your role, food is a big help. One person organized a potluck lunch for the first meeting—in the spirit of people helping each other, sharing resources, and networking.

Once you're underway, Kathleen Devaney, the Teachers' Center Exchange Director, describes 12 strategies to make you more effective as teacher consultants:

> SEEK (1) Be curious, interested, concerned—and let it show. These attitudes must be genuine. Until you become interested in a teacher's practices, students, ideas, and problems, you won't make good connections. In gathering information, emulate a good (but kindly) reporter—probe for the intentions, assumptions, and puzzles that lie beneath a teacher's original question.
>
> SCOUT (2) Look for talent. Consider that scouting implies unearthing hidden or unacknowledged talent and finding the right assignments/events to develop and spotlight it. Unlike a show business or sports talent scout, you may frequently have to convince people that they do have talents others would value. For instance, teachers aren't used to thinking of themselves as educators of *adults*—they think only college professors and outside consultants do that.
>
> SEARCH (3) Find strands that connect people—professional experiences, backgrounds, ambitions, and the personal details that go with them—hometown, alma mater, previous job, academic specialty, hobby, friends. Don't be presumptuous or nosey, but pay attention to inadvertent details so that you can remember whole persons—not just names and job titles. Be a string gatherer. You never know when you might need that one seemingly insignificant detail.
>
> ANSWER (4) Always react personally to a serious inquiry. No form letters, information packets, or perfunctory phone messages. Set an informal, personal style.
>
> RESPOND (5) Get back right away. A prompt reply is usually more important than a profound one. Keep current with requests, not only for the inquirer's sake, but your own. The longer a request is postponed or the more it's handled, the tougher it becomes to deal with. A precaution here, though: you are no more than an amiable teacher dealing in gimmicks and quickie solutions, if you fail to balance the concreteness and rapidness of your responses with the thoughtfulness required in looking at their larger questions over time.
>
> OFFER (6) Give something practical—a reference to a program to visit or a person to phone. Send a brochure on an appropriate project or upcoming event. Unlike research documents or references in professional publications, these things advance the requester's intention to act

and help persuade the person that his/her ideas and plans are realistic.

ENCOURAGE (7) Provide support as well as information. Offer a listening ear and encouragement for an indecisive, puzzled, burdened, or harrassed requester. Do not, however, suggest that you can solve the problem. You are not an ombudsman.

FOCUS (8) Pinpoint requesters' needs and get them to elaborate on them. Keep asking questions until you get a good picture of what they've got going, what resources they can tap, what they hope to accomplish, what their obstacles are. Get them to reflect on their struggles and the allies they haven't been using. Highlight assets, not deficits. If the request is in a letter, read between the lines to feel out the teacher's situation. Helping teachers reflect on their work is a long-term process. It's difficult to teach and think about teaching at the same time.

INITIATE (9) Lead off as well as respond. Compliment a good piece of work or send along a pertinent or provocative clipping. With proper respect for the workload, respond when the spirit moves you—with time, ideas lose freshness and enthusiasm fades. Besides, letters done in the warmth of inspiration almost write themselves.

GUARD (10) Protect confidences. Don't gossip. Don't gush. Be friendly *and* professional. Avoid any suggestion there's an "inner circle."

CARE (11) Attend to details. Because professional relationships intertwine with personal ones, to foster the former you must pay attention to the later. When people feel strange, lonely, pressured, or unappreciated, their sense of alienation and inadequacy will make it difficult for them to learn, communicate, contribute. Be sensitive to their signals. Attending to personal details—like making them comfortable and included at meetings—will never be deemed less-than-professional if it's also accompanied with scrupulous attention to work details.

ACCEPT (12) Don't judge. Never compare teachers or projects. Quality tends to surface naturally in an active, communicating network of professionals where the goal is not to "improve" or "reform," but bear witness to educational ideas, ideals, and practices that have achieved success and respect in many different settings and thus hold promise for wider use.

If the job seems overwhelming from these suggestions, don't grit your teeth. As a teacher consultant said to me, "Quantity is not the measure of success. You can't think in terms of working with everyone." Another suggested, "It only makes sense to start with the self-motivated learners. After a while you begin to spend two-thirds of your time with them and one-third with others. You are not *leading* people, but following their lead. You are responding to people, not directing them." Kathy Devaney puts it this way, "If your resources are limited, work with people who are already in motion, meeting you halfway. You can't afford to cast your seeds on dry ground."

Finding time is hard, but remember this is an ongoing, developmental relationship. You don't have to do everything now. Looking at the three stages of consultant work helps. Typically, these are:

(1) responding to individual requests

(2) supporting staff improvement—especially with small groups

(3) enabling colleagues to work with each other in depth over time.

Risks and reward are part of the game. You have to be willing to take a chance. Not so much to stick your neck out, but as one teacher consultant described it, to be "a toe-dipper who appreciates how much can be learned from mistakes." Give yourself time and permission to risk and grow.

Rewards are not extras. They're necessities. Kathy Devaney says:

> Any enterprise that depends upon voluntary participants (that's both the teacher consultant and the teachers they're working with) must make its rewards evident and genuine. Sensible, competent people do not volunteer unless their contributions are recognized. You and they must be provided with ethical, esthetic, intellectual, or social rewards for participating. The primary reward is that everyone's craftmanship as a teacher is greatly improved; your own work is advanced along with the work of those around you. But there is nothing complicated or expensive about good manners, friendship, acknowledgement, efficiency, and seeing the results of your efforts.

I'd like to illustrate what I've said about teacher consultants—who they are, what they do, and how they operate—by describing three people who are currently working in this way.

The first, a secondary science teacher in Connecticut, began by setting up a materials and resources exchange area in the teachers' lounge. He did that with four other teachers, including the shop teacher who organized the building and painting of large bulletin boards. They knew that teachers were reluctant to simply put out their materials, where they might "walk off," but they also knew that teachers are delighted to share materials when they know who has them and when they can talk together about new ways to use them. So, the exchange began with announcements on the bulletin board of things people would like to share. Eventually, faculty members began to put up requests of things they needed—and

then the exchange really began to happen. There were complaints about lack of sharing of A.V. equipment, and the teacher consultant took the lead in putting together a group to work that out. About a month after the bulletin board exchange, the consultant used half a faculty meeting for a brainstorming exercise and Wealth Assessment to demonstrate how many resources the teachers had within themselves. When I asked him if he had any advice to pass along, he said, "Be sure to present yourself as someone offering a service. Stay away from the word 'help.' 'Help' implies someone is in distress. Teachers are not in distress. Don't go around offering to do things; support what teachers are already getting started. People won't come to you with 'Hey, I need this.' But if you've done your homework by finding out what they're into, then building up a reservoir of people you can call on for ideas and resources, you'll be able to plug in appropriately to what they're doing."

Dinosaurs are the way a fourth-grade teacher consultant in Vermont began to work with the 12 teachers in her building. One day during recess, some younger brothers and sisters of her students noticed the dinosaur posters in her room and began talking about the dinosaurs they were studying in their room. That prompted her to issue an invitation to all teachers who were studying dinosaurs to come in for an after-school sharing (with refreshments) and to bring in the materials they used. That idea exchange started the ball rolling. They first identified a need to know what the others were doing so they could build on it. The primary teachers decided to meet later to look at the way kids best learn place value in math. The upper elementary teachers met again to discuss science, then moved on to social studies. From this simple materials exchange on one Tuesday afternoon, the teachers own natural inclination was to grow toward a deeper learning relationship with each other.

The principal also had a need the teacher consultant was able to address. He didn't like the impression visitors first got in the front hallway—with cases of athletic trophies and graduation pictures from before World War II. Since the school was about the business of educating children, he felt children's work should be the first thing seen inside the building. The teacher consultant agreed to collect and display children's work—but only if the teachers agreed. They did agree, of course, because she made it easy and interesting for them. She kept on the lookout for special work—not art work, of which there was plenty—but things that would stimulate and challenge teachers *and* parents. The teacher consultant had a special twist in setting up a display—while the teachers put up the work, the consultant took dictation about how the work was begun, how it fit into the curriculum, what came next, and any special highlights. These few paragraphs attached to the display always carried an invitation to other teachers and parents to come in and talk about the work and share anything similar they were doing.

My own consultant work is the last example I'd like to share. A particular interest of mine is trying to figure out how kids learn and think. I loved talking to other teachers about my former students, so it became natural for teachers to ask me about certain children that were puzzling them—or driving them up the wall.

I had two strategies in mind with such teachers: first, to support their own perceptions and, second, to connect them up with other teachers who'd had the same students.

I would begin by suggesting to a teacher that I'd keep an eye out for this kid—at lunch, on the playground, or by working out a way for the child to drop by my class. I'd take notes on my observations, and ask the teacher to keep a running record of anything the youngster did that puzzled, bothered, or delighted them. In about a week, we'd compare views. Of course, by that time, the teacher often had a clear picture of what was going on and what would be good to try.

My next step was to connect the teacher up with two (or more) teachers who'd also taught the child. I would check with the other teachers first, though, and have them think through the positive advice they could give—to prevent an ain't-it-awful session when the teachers met.

Another teacher consultant technique I found successful helped me to share content area ideas across grade levels and focus on a school-wide concern of the principal's. When I tried something new with my kids, I checked with teachers at my own and different grade levels who were trying it out, too, so that we could share ideas and results. The principal was delighted because, up until then, teachers had resisted dealing with articulation and this was a teacher-originated way to start the process.

All of these are examples, of course, not prescriptions, for what works. At a meeting in Torrington, when one of the teachers had heard all this, she said (with a big sigh of relief), "Well, it's going to be something I want to do after all. I don't have to be all things to all people. Actually, when I think about the descriptions, it's pretty much what I do already." Another said, "It's what I've always wanted to do, but I've not had the chance." A third person topped it off with an excellent summary of teacher consulting, "I see our role now as a guide on the side—not a sage on the stage."

WEALTH ASSESSMENT

Share with the teacher next to you. Then record your partner's answers to all the questions.

Name:

School Phone: Home Phone:

School Address: Home Address:

A. Thinking back over all the resources and people who have helped you become a better teacher, what or whom do you consider to have been major sources of help and support in accomplishing your own teaching objectives? Who were *your* "teacher consultants," advisors, and supporters?

B. Up until now, have teachers in your school worked independently of each other, or have you worked closely with others, teaming up in some way(s)? Do you have contact with teachers outside your immediate working group or outside of your school? If so, what are these connections?

1. Please check all the kinds of schools you have taught in:

____ rural, isolated	____ preschool	____ middle school	____ team-teaching
____ small town	____ K-3	____ jr. high	____ multi-graded/mixed age
____ suburban	____ K-6	____ special ed.	____ interdisciplinary subject areas
____ urban	____ K-8	____ college/univ.	Class size:
____ inner city	____ K-12	____ adult ed./cont. ed.	____ 0-10 ____ 21-30
____ mixed (_____).	____ 9-12	____ private/parochial	____ 11-20 ____ Over 30

Other: _____

2. List the grade levels and subject areas you have taught. Add how many years in each.

3. Since you began teaching, have you developed interests in a particular subject or project area, special teaching methods, or any other "specialties"? What are your particular skills or areas of expertise?

4. What about your "outside" interests? Do you have personal hobbies, skills, or interests that could connect with classroom teaching? If you had the opportunity to take extended time off for learning, what would you want to learn about? How would you go about it?

5. What material have you gathered—both things in your classroom and materials that support your own learning—that you would be interested in talking about/using with/perhaps loaning to others?

6. Have you been a leader in working with teachers in your building, your district, state, etc.? What was your role?

(Answers to A. and B. are for your own reflection. No.'s 1 through 6 will be tabulated and handed back to everyone along with names, addresses and phone numbers.)

WHAT'S A WYOMING TEACHER CONSULTANT *REALLY* LIKE?

by Lyn Moran

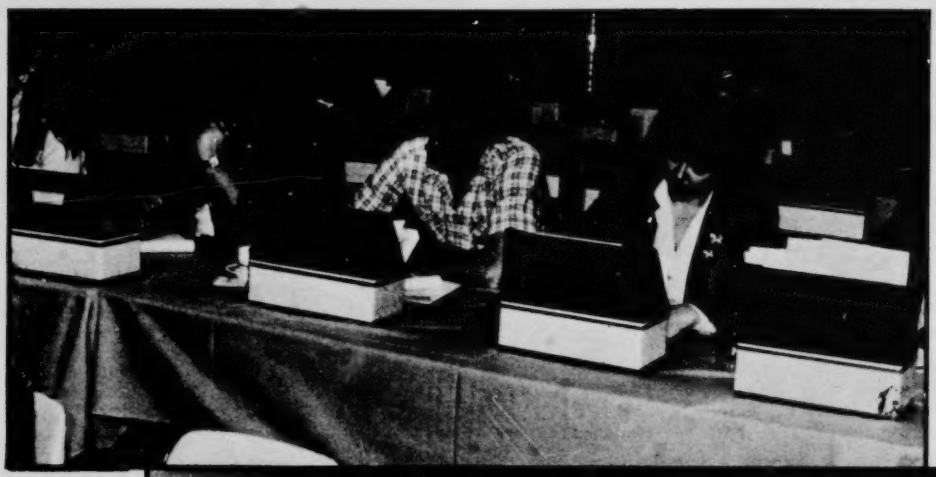
Probably a lot like you. Teaches all day. Pulls bus duty. Has a professional meeting tonight. Needs to run off 30 dittos by 4 o'clock.

Nothing so unusual. Except that a lot more lately, the "t. c." can be seen quietly chatting with the new teacher over how things went today. Tidying up a corner of the Lounge for a materials exchange. Talking with the principal about time-on-task. Listening very closely to Mrs. Johnson, the old teacher with some new problems, saying, "Uh huh . . . I see . . . Mmmm."

Teachers helping teachers is a tradition as old as teaching itself. But there's a special way teacher consultants do it that makes the effort more productive.

In Wyoming, that's not only a matter of style but of number. In the past year, the Wyoming Teachers' Center Workshops have trained over 170 teacher consultants in nearly every school building in the state.

When we chose a sample of five consultants to interview, we thought of it primarily as a personality profile. It was—and something more. In the stories of three high school and two elementary teachers, we found not only how teacher consulting works, but why.



—Wyoming Teachers' Center Workshops—

Eileen Grove

Dubois Elementary, Dubois

"Have to rely on ourselves"

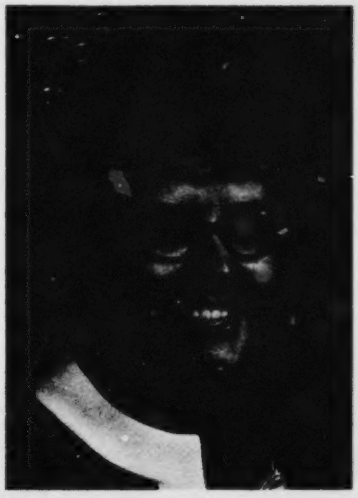
In a small community, you learn to do that—help each other. Eileen, who's taught third grade for seven years in Dubois, feels that teacher consulting is not much different than what she would've done anyway except that it gave her a little extra impetus, a little better way to reach people. "Now if I kind of hear someone needs something, I round up materials to help them."

She's worked with the new teachers in school, given out information on preparing children for standardized test-taking, administered a faculty Wealth Assessment and shared the Motivation Menu ideas.

A unique contribution has been her work with the resource specialist and six other teachers in teaching sign language to slow learners to assist them with reading skills.

"Most of my contacts are very informal." So helping with bulletin board ideas and compiling lists of materials teachers would be willing to share—like maps and rock collections—is all in a day's scope and sequence.

She can see the fresher possibilities for starting early in the fall. "Don't feel bad if you don't know



Eileen Grove
Dubois Elementary
Dubois

all the answers—if you know where to help them get the answers. Even though some of the things you do may not work, you can't feel you've failed." "Of course," she says with a chuckle, "that's easy to say, not easy to do."

"The point is," she concludes, "a teacher consultant is someone people can use for a sounding board," a colleague with whom they can feel comfortable. "The big thing is to *listen*. People can solve their own problems."

With a little help from their friends.

Maureen Ryff

Wheatland High School, Wheatland

"We just needed this"

"I've been busier doing this than I ever thought I would be. Be neat if this were a full-time job."

Such high marks come from the teacher who has all the social studies classes in a high school of approximately 500.

Maureen Ryff
Wheatland High School
Wheatland

Maureen got off to a fast start with teacher consulting. "We felt fairly comfortable starting here." Two short faculty presentations by her and the junior high representative on team games and discipline launched a before-school discussion group on discipline, teacher image, and sex equality. For teachers to voluntarily give up valuable pre-school time every Thursday means, says Maureen, a lot of good things are happening. "We've changed some ways of doing things around here—like making the Prom Breakfast part of an all-nighter for the faculty. It's helped get teachers together. Friendships have formed."

The Thursday discussions have built bridges and removed walls. "We've tended to be pretty departmentalized," she says, "but this has given us more contact than we'd have had otherwise. The group is more supportive of each other. Teachers now come in with topics—sometimes one topic will take up several sessions. The administration even sat in on

a few. Some resulted in action plans, others just in tension release. Three or four teacher projects have begun not only here in the high school, but in the district."

This school-wide cooperative effort was targeted at a local bond election. "We came out with a lot of positive ideas from faculty."

One-to-one teacher contacts have also resulted where help was needed in difficult situations with parents and legal matters.

"It's really neat to be able to work with the faculty. I get to reach into places I wouldn't otherwise—which is really building networking."

All that said, her next statement is a bit startling--"I'm not sure I'd have done it without the teacher consultant role. Irene is so helpful. How we need a permanent Teachers' Center in Wyoming."

"I'm sorry my job will end."

Then, thoughtfully, "This year has really brought us together."

And yielded an even higher Wealth Assessment.

Carol VanDerWege

Jeffrey City Elementary, Jeffrey City

"Acknowledged sharing"

For a school with teachers who are "always searching for innovative ideas, new ways to present old materials," teacher consulting was a welcome addition to the staff. Carol, who's taught first grade at Jeffrey City Elementary for four years, looks upon what she does as "working with my old pals here at school—teachers who are very ready, very open to suggestions."

One of the special things Carol asked the teachers for was input into a "Fresh Ideas File"—to pick from their bag of tricks one or two game, ditto, learning center or other good ideas they'd like to share. Teachers have even been willing to put up their classroom displays on the bulletin board in the Lounge.

Carol VanDerWege
Jeffrey City Elementary
Jeffrey City

"Teachers here are very professional," Carol says. "They love workshops. Since they chose me to go to a Teachers' Center Workshop, they wanted to know right away what I was doing. They wasted no time in requesting things like the new kind of ditto materials, resources on the topic of money, and team learning."

"This has brought our small teaching staff together—made us closer," Carol has found. The principal has been "extremely cooperative and helpful in what I've tried to do. He sends things directly to me. He especially appreciates what the program has done to help the faculty."

Carol recognizes that to do the job well, "you can't be pushy. Be open for new ideas."

"Of course," she notes, "that's what we were doing all along, but didn't know what to call it."

Nothing is perfect, though—teacher consulting has made her want more—more materials to draw upon, three times as big a resource room, a larger library. She'd also like to expand the Wealth Assessment to include parents.

The one thing she hasn't had to do without is interest in the job and support from her school: "I'm thrilled to death I got involved with it."

No one from the Teachers' Center could've said it better.

Phillip Quink

Big Piney High School, Big Piney

"Keep an open mind"

Teacher consultants open minds—and doors—in Phillip's experience. As a high school business teacher for 13 years, his new role has made it easier to relate to other teachers outside his field—"to cross department lines and talk about teaching kids." Since the Teachers' Center Workshops, he's gotten together more with individuals and groups about common problems. Comparing notes with other teachers about a class bully, for instance, can do more than track a case history and find some clues to what might work—it can build support among the teachers.

Whether it's "I've had that problem before, I'll help you" or "I haven't had that problem, but I'll find out," Phillip says, "I get reading material out and help them." He's used his own and the Teachers' Center resources and encourages teachers to use the materials exchange he set up in the Lounge. The teachers were particularly interested in the filmstrip he showed on stress. That's prompted him to want more film materials made available to teachers on the handicapped, reading disabilities, problem children, and classroom management.

"Until you talk to them, you don't realize all the problems teachers have. And when you do, you realize how much you share common concerns."

There are others in the school district who support what he's doing for teachers. One is his principal who attended the Teachers' Center Workshop with him, helped introduce the idea at a weekly faculty meeting, and had anticipated needs by getting some materials Phillip had wanted for the teachers.

Phillip Quink
Big Piney High School
Big Piney

Another supporter is his wife, Patricia, who is a teacher consultant at her elementary school and "really likes it."

"It's made me feel good, too," he adds. As the year wears on, some of the newness will wear off, he thinks, but not "the idea that I'm here to help if they need it."

Check it out. He's right down the hall in Room 106.

Margie Blanchard

Hot Springs County High School, Thermopolis

"And the network grows"

Margie Blanchard would like "instead of me being the facilitator, everyone a facilitator." Her work is cut out for her on a high school campus of 273 with 32 other teachers, but her teaching assignment offers her some excellent opportunities to reach other teachers and the community. Although Home Ec. is her home base, as Community Resource Trainer for two periods a day, she handles a unique work-study program for her students with Thermopolis businesses. As Teacher Association President, School District Professional Council member, and Future Homemakers of America Advisor, she deals with teachers and administrators on local, district, and state levels.

Teacher consulting has made her "more structured, more organized" in what she does as liaison with all these groups.

"I've worked more actively and been more supportive," she says, of special projects like the interdepartmental fashion show, academic freedom book selection committee, and as coordinator of Wealth Assessments—at the elementary, middle, and high schools. Her principal was particularly interested in her faculty report on time-on-task.

Working with a large, departmentalized system, she thinks, requires you to "make sure you listen and not project your needs onto them. Sit back. Let it sink in before you act. What they're saying may not really be what they're asking."

Her advice to a beginning teacher consultant would be "not to give up, not to be discouraged just because you had a great idea and nobody responds. Things won't happen as quickly as you want them to do. Sometimes it's hard to start fires under people, especially if they've been doing it their way a long time. They're not always going to see their needs the way you do."

In building a "Louise Jackson-type 'broker system' of teacher consulting," she says, "the pay-off is to finally get someone excited about learning by expanding on ideas, adopting new concepts, or just trying something old that's new for them."

She'd like to "reach more staff—we don't have many opportunities to meet." Especially, she can see the advantage in holding workshops on school improvement topics like teacher expectations or conducting small group discussions on motivation. Her work-study assignment has shown her how valuable more community involvement would be. "There's a lot of expertise out there we could tap—and that validates us, too."

Right, Margie. Hard work. Help wanted. Apply now.

Margie Blanchard
Hot Springs High School
Thermopolis

WHAT ABOUT PROFESSIONAL DEVELOPMENT?

by Lynn Simons,
State Superintendent of Public Instruction

As educators, most of us are committed to lifelong learning, whether to satisfy an insatiable curiosity, to grow personally, to develop professionally—or just for the sheer joy of it. Most of us, indeed, are not only teachers, but learners, as well.

In that segment of our learning devoted to progressing professionally, we often encounter frustrating obstacles. One is direction. While there are times, usually early in the career, when we know "exactly" what we need, many times we do not. Paradoxically, it is frequently when we become more skillful, practiced, and competent that we founder, knowing that we need to grow, but stymied about how and in what direction. Often times, even when we have an idea of what we want to do, we are caught by state certification requirements which channel us into irrelevant, or seeming irrelevant, directions.

Another common obstacle is lack of opportunity. Academic learning is limited because of Wyoming's unique system of higher education with just one university which offers upper division and graduate programs. Extension classes are available, but scarce. Most of our communities are not large enough that there is a professional cadre of enough depth and breadth that we might grow professionally through regular, day-to-day contact with a variety of colleagues.

Finally, there are the double frustrations we share with other professions: finding time and finding money to fulfill the obligation to ourselves to grow professionally.

What do we do? Where do we go? And how do we get there?

Let me lay out a few of my thoughts on these questions. They are not definitive, nor the last word, but rather, I hope, the opening sentences of a dialogue among all of us who share an interest in professional development.

First, the direction of an individual's professional growth should be largely self-determined with assistance given by supervisors and peers, if possible, who have participated in evaluating the individual's performance.

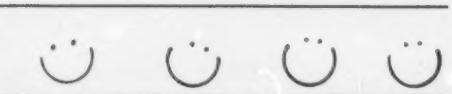
Second, certification regulations should broaden, not constrict, opportunities for growth after certain initial requirements are met, usually in the undergraduate training program.

Third, a variety of sources for professional development should be available not only on college and university campuses, but also in the communities. If possible, these sources should be coordinated, a "Professional Development Institute," if you will, including the University of Wyoming; the community colleges (with special authority to present upper division programs); the State Department of Education; and the school districts, schools, administrators, and teachers, sharing expertise both within schools and districts and across district lines to outside schools and districts. Other sources, such as private consultants, educational laboratories, and non-education-related and local agencies, could be tapped by the Institute as needed. The SDE's "broker system" incorporates some of this thinking. It is a recognition that many resources are available to deal with educational problems. The SDE is one resource, but not the *only* one, and it may act as middle man, or "broker," to link a school district with a problem to a resource with a solution.

Last, the school year should be extended *and* funded so that professional development becomes a regular and expected part of an individual's professional obligations. In both the 1981 and the 1982 Legislative sessions the SDE budget included a request for funds for extra days, at local district option—185 days in 1981, 183 days in 1982. Both times the requests were denied.

I welcome your comments on these suggestions and caution one and all that they *are* suggestions, not directions, and I have presented them to stimulate discussion, comment, and, maybe one day, a new and better direction for us all.

HOW ABOUT SOME S.M.I.L.E.S.?



by Judy Lissman

Though the focus of the state-wide Wyoming Teachers' Center was program activities, many teachers' centers based in local school districts across the country are housed in a "place" and teachers use that location to gather, exchange ideas, and make instructional aids for their classrooms. Each of us has the beginnings of that kind of teacher center in our own school. Many of the Wyoming Teachers' Center Consultants who attended a two-day Center workshop conducted a Wealth Assessment of their building faculties. This Assessment, which is based on the strengths that the faculty has, will indicate areas of interest and expertise, and materials that people are willing to share. (If such an Assessment has not been conducted in your building, the form and "how to" for doing one are found in "Do-It-Yourself Kit of Teacher Consulting.") Using this kind of data as a starting point, other educators who might be interested in supporting your efforts can be located. A list of existing materials available for sharing within the building can also be drawn up—or the materials themselves gathered in one place.

There are many ways of obtaining the odds and ends for making new items to perk up teaching strategies and classroom activities. Start by finding a location in your room or school that could contain the creative assortment needed for making classroom materials. Then send letters home asking parents to save such items for your storeroom.

To get started, place large boxes, plainly marked on the outside with the contents, in your mini-center work area. As the items arrive, place them in the proper box for later use. Some suggested items are: Pringle cans; spray can lids; toothpaste and other tube caps; pizza boxes; pizza wheels; foam containers from fast food places; soap; bleach and other plastic bottles; plastic lids from all size containers; catalogs; magazines; old color books; plastic tubs; plastic shopping sacks, etc.

By canvassing area merchants you can add wallpaper books, carpet samples, paper scraps from the printing shop, cardboard boxes, ice cream containers, etc. Once you start collecting, you will discover other "goodies" you can use.

Another valuable asset to your center can be the magazines, newspapers, and books published monthly for teachers. One suggestion is to arrange them by months rather than by publishers. That way if you are looking for a bulletin board or learning center idea, poem, or activity, you will be able to find one that fits into a particular theme. Try making a list of materials that the teachers are willing to share and put it in an accessible place for everyone's use. Sharing of ideas, materials, information, resources—and yourself—is the best start for a teachers' center made by and for teachers.

Whenever you see or hear an idea, figure out how it could be adapted for your own use to fit the needs of your students. You need not follow the directions exactly or use it only for the idea shown. Many ideas can be interchanged using the same format, but with different subject areas as objectives.

Essentially, what you are building with all these materials is a S.M.I.L.E.S. Kit (Simple Materials for Individualized Learning Experiences and Skills). Some other basics you should add to your kit are: Tag board, poster board, construction paper, file folders, wallpaper, clothespins, golf tees, yarn, brads, paper clips, zip-loc bags, laminating film, plus equipment for preparation: magic markers, rulers, scissors, razor blades, reproduction machine, and laminator.

Unique ways to use your S.M.I.L.E.S. are: Use purchased dots, seals, stars, etc. to make gameboard tracks. Create gameboards out of pelon. Make game pawns from bottle caps, tube lids, or old magic marker caps. Instead of coloring, use wallpaper for pictures or as sections of patterns. Attach velcro or magnetic tape to items with spray adhesive. Use brads and paper clips for simple spinners. Try clothespins as moving parts for centers or hanging displays. Use golf tees for poking games. Since colors, vis-a-vis, and grease pencils are good for easy erasing, but smear easily, use permanent markers and clean up with duplicating fluid, fingernail polish remover, or hair spray. Liquid embroidery or water-based magic markers are also good for writing.

You can store and file your S.M.I.L.E.S. several ways: Pringle cans can be used for storing of gameboard parts, or as a stand-up device by cutting it apart about 3" tall and then making a cross-cut down through it in order to set up a poster. Pizza boxes and fast food tray cartons also make excellent storage containers. Game pieces or other small easily lost items are best stored in zip-loc bags. Large posters can be placed in poster board folded and stapled together at the sides. Storage boxes can be covered in colorful contact paper.

Use a S.M.I.L.E.S. File to classify materials for easy retrieval. Color code, number code, or letter identification labels can be used to mark materials. Set up a file card system to help your ideas.

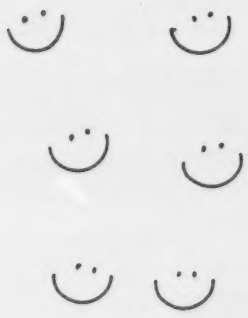
Another resource that can be useful is the service provided by the Wyoming State Department of Education. A request to your building administrator for a "make and take" workshop from the Department could result in an inservice activity that would be of help and interest to many teachers.

Obviously, from these lists you'll have a lot of ideas to share and that will get shared with you. But that's the way it is when you S.M.I.L.E.—people will S.M.I.L.E. back.

Judy Lissman is an elementary teacher from Huntley who also serves on the Wyoming Teachers' Center Policy Board.

S.M.I.L.E.S.

A CONDENSED LIST OF USABLE MATERIALS TO SAVE FOR THE TEACHERS CENTER



Business Scrounge Materials

Art supply and stationery stores:
any leftover or damaged stock

Architects:
blueprints

Billboard companies:
pieces of billboard posters

Building supply companies:
wood, lumber, wallpaper books, tiles, color samples, paint

Churches:
used candles

Contractors:
lumber, pipes, wire, wallpaper, linoleum, tiles, molding, wood, wood curls, etc.

Department stores:
stocking boxes, lingerie boxes, styrofoam, decorative displays, posters and business forms, shoe boxes, unsaleable items

Drug stores:
small plastic bottles

Electric companies:
cable spools, tape containers

Clothing and garment factories:
spools, fabric scraps, etc.

Grocery stores, supermarkets:
cartons, wooden crates, meat trays, discarded display racks

Ice cream stores:
3-gallon ice cream containers

Lumber companies:
scrap wood and lumber, bricks, concrete blocks, doweling, etc.

Offices:
discontinued business forms and posters (anything blank on one side), pencils, office furniture, envelopes, carbon paper, computer printouts, ditto stencils, stationery, office supplies that are no longer needed (binders, staples, in/out trays)

Paint stores:
leftover paint, sample books

Paper companies & printing companies:
endcuts, damaged paper and posters, paper rolls

Phone company:
colored wires, damaged phones

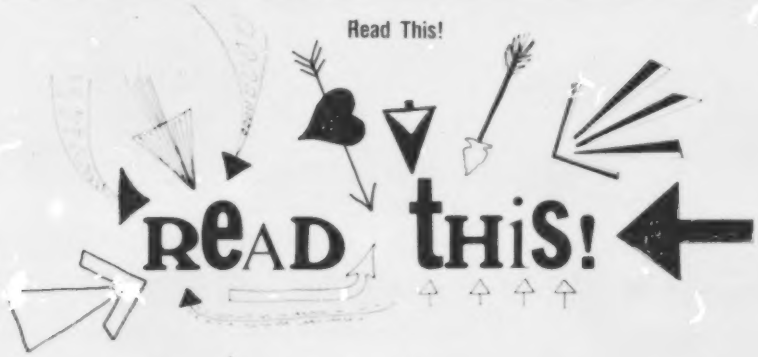
Plastic companies:
trimmings, tubing, scraps

Restaurants:
corks, bottle caps, used candles

Rug companies:
leftovers, pieces, samples

Household Scrounge Materials

golf tees
egg cartons, "L'eggs" eggs
cardboard tubes
plastic containers
durable containers
juice, coffee, & Pringle cans
meat and produce trays
strawberry baskets
bottle caps and corks
aluminum pie tins
styrofoam packing materials
foam rubber, coat hangers
magazines and books
maps and pictures
greeting cards, wrapping paper
calendars
sturdy boxes: all sizes
corrugated paper and cardboard
buttons, spools, ribbon, yarn
string, rope, costumes
stockings, gloves, purses
jewelry, popsicle sticks
fabric and fabric scraps
old toothbrushes
rug and carpet pieces
wood and lumber
candles and wax
rubber bands, bag twisties
paper and plastic bags
reusable paper, posterboard
cardboard, old newspapers
nails and screws
envelopes, mailers, folders
brick and concrete blocks
furniture
wallpaper leftovers
pillows and cushions
tiles and linoleum pieces
flat stones, pine cones
feathers, playing cards
rice, dried beans, macaroni
baskets, kitchen utensils
measuring devices
pencils, pens, crayons
leftover paint
baby food jars, jars w/lids
durable containers
kool-aid, etc. cans w/lids
unwanted plants, flower pots
old gameboards, dies
margarine tubs w/lids
Christmas card boxes, preferably with lids



from *Research Within Reach*

by Phyllis Weaver with Fredi Shonkoff

Elementary school teachers and reading specialists are faced daily with the need to make complex instructional decisions. They are constantly looking for answers to specific problems or attempting to find an instructional approach that will work for a particular child or group of children. The means teachers use for solving their problems are varied. Frequently, they review the teacher's guides that accompany basal reading series or sets of supplementary materials, consult the curriculum guides developed and provided by the school district, and discuss their concerns or problems with co-workers. Occasionally, they consult their supervisory and support staffs.

The one source of information most teachers do not consult is the research literature--they feel that research activity is so far removed from the classroom that it will not help them solve their immediate instructional problems. And yet, since the turn of the century, more research has been done on reading than on any other curricular area.

Is the application of research to instructional practice important in the field of reading? Can the results of research be used to improve teaching? The answer to each of these questions is "yes," but if this is true, why is it that practitioners seem to automatically discount the usefulness of research literature?

First, researchers traditionally have been reluctant to speculate about the educational implications of their work. Instead, the work they do often results in the need for further research.

Second, the size of the units of analysis in laboratory-based research are quite different from and appear incompatible with those of the classroom and even the clinic. Researchers study reading in terms of milli-seconds, letter features, and the duration of eye fixations. Classroom teachers and specialists are concerned with whole reading/teaching methodologies, often with groups of children at a time, and they operate in relatively uncontrolled—in the statistical sense—environments. Thus it is not surprising that research results have been difficult to apply.

Finally, because the jargon, methodologies, and concerns of researchers and practitioners are usually so different, there has been an inadequate exchange of knowledge between the groups. The usual form for exchanging scholarly information is through journals and paper presentations at professional meetings. However, most practitioners do not read the *Journal of Verbal Learning and Verbal Behavior* or attend the annual meeting of the Psychonomic Society.

How *Research Within Reach* Was Developed

We were not interested in simply reporting the results of a review of the research literature to reading educators. We worked hard to discover a process that would ensure the relevancy of the work we would be doing. We decided that the best way to do that would be to actually go to reading educators and ask them to describe for us their most pressing concerns and needs in relation to reading instruction.

We selected a group of 14 practitioners—classroom teachers, reading and curriculum specialists, and school administrators—with whom we had been associated and whose work we respected. We conducted telephone interviews with these practitioners, asking them to identify problems and questions about instruction in reading that they would like to see researchers address.

The questions addressed here reflect a synthesis of many of the 75 questions raised during the interviews.

The process was complicated and time-consuming, but it was also extremely rewarding. Researchers are not able to reach consensus on many of the

Research Within Reach: A Research—Guided Response to Concerns of Reading Education was developed by CEMREL Educational Research Laboratory in St. Louis under a grant from the National Institute of Education.

questions—consensus may never be reached—but the authors feel comfortable that the answers given here are the best answers that the research and educational practice can currently give.

Should I Use a Subskill or Holistic Approach?

QUESTION

Our school district is conducting a review of the objectives established to guide reading instruction in the elementary grades (one through six). The language arts curriculum committee has identified a large number of separate subskills that they claim should be taught in the six grades. I am a new teacher, and I don't want to make waves, but I can't imagine that anyone, let alone a child, could do so many different things during something that takes place as fast as reading. Is reading really just a lot of separate skills that are performed rapidly, or is it more like a single process that cannot be separated into component skills?

In this debate among theorists and researchers, we can identify three major positions: all reading (beginning or skilled) is holistic in nature; all reading consists of separate but integrated subskills; and skilled reading is holistic, but early reading consists of subskills.

- All reading is holistic.

What ought to be remembered about the holistic view of reading is the notion that reading at any level is not conceived as a combination of separable subskills but is instead viewed as a process whose focus is the communication of meaning.

Beginning readers have only begun to develop this awareness of oral and written language patterns. Therefore, they are less efficient than skilled readers at deriving meaning from sampling the text and need to be exposed, even immersed, in an environment that is rich in language.

- All reading consists of subskills.

Individuals who hold this position argue that although skilled reading may appear to be a single process, it is not. In skilled reading, the separate subskills have become so well integrated that readers don't have to pay any attention to them—they all seem to operate automatically.

Unlike skilled readers, beginning readers haven't learned all the subskills, and the ones they know aren't used together very smoothly. For example, they often concentrate on pronouncing individual words (even parts of words), and they can only recognize a limited number of them. It is common for beginners to come to the end of a sentence or passage and seem not to understand or remember what they just finished reading.

Most individuals who support this view believe that teaching the subskills is not enough; you must provide plenty of practice using easy materials so that the subskills will not need conscious attention and will become integrated into what looks more and more like skilled reading.

- Reading is a combination of the holistic and subskills positions.

A third view on the nature of reading combines the other two. Supporters of this position make a distinction between beginning readers and skilled readers, that is, they think that the nature of the reading process actually changes as skill develops. In the early stages reading is accomplished by attending to identifiable component skills or parts; by the time the skilled level is reached, reading has become a meaning-oriented process and is no longer divisible into subskills.

What actually is the nature of reading? Which of the descriptions is accurate? The research findings currently available do not provide conclusive information, and it may take a long time for these issues to be resolved and supported by the results of research. Reading educators do not have time to wait. Whatever view of reading is accurate, we think it is helpful to make the distinction between the reading process and effective teaching of reading.

Reading educators do not have time to wait.

Although some research suggests that skilled reading is a single, holistic process, there is no research to suggest that children can learn to read and develop reading skill if they are taught using a method that treats reading as if it were a single process. Therefore, for instructional purposes, it is probably best to think of reading as a set of interrelated subskills. The separate skills should be taught, practiced, and integrated with other skills being taught and with those that have already been learned. The important thing to remember is that although reading may be taught subskill by subskill, students should always have ample opportunity to practice the whole activity.

How Do I Sequence Subskills?

QUESTION

I am a fourth-grade classroom teacher. Our district has adopted a skills-oriented reading program

to assist us with instruction and evaluation in reading. Although our students appear to master many of the subskills of reading, they do not seem to integrate these skills enough to become fluent readers. A number of teachers that I have talked with share this concern and worry about the emphasis that has been placed on the objectives or skills approach to reading in instruction. Is there guidance for how to integrate subskills so that our students become fluent readers?

I have another, related problem. Our program specifies the order in which we are to teach the reading subskills. The teacher's manual says that the subskills we teach earlier are prerequisites for the ones we teach later. This hasn't always worked. There are some students who seem to know all the prerequisite skills listed and still are not able to learn those next on the list. Sometimes the opposite is the case—some students show mastery of skills that are supposed to be harder than others that they are unable to learn. Are there any suggestions for the proper sequencing of the subskills in reading?

Our recommendations may seem fairly simple given the complex nature of the questions. They are simple and general by necessity, because there is not enough research in this area to permit us to be more detailed. Instead of being guided by research, they are guided in large part by common sense and experience—our own and that of others whose work we respect.

If students seem to have mastered the subskills of reading and have not become fluent readers, it could be that they have not had enough opportunity to practice newly acquired skills in the context of actual reading. Thus, we recommend that as soon as skills are performed accurately, they should be practiced until they can be performed rapidly and with minimal attention. This should be done using interesting and meaningful materials whenever possible.

If students are not learning reading subskills in the order suggested by program developers, the order could be wrong in general, or it could be wrong for that particular group of students. If the order appears to be incorrect, use the prescribed order as a guide and modify it, using observations and common sense.

Remember that being able to perform subskills of reading is not all there is to reading; it is a means for developing reading proficiency and is not reading itself. Thus, we recommend that subskills teaching and practice be balanced with a lot of reading. Use books, magazines, newspapers—anything so long as the students are actually reading meaningful text.

Use . . . anything as long as the students are reading meaningful text.

How Can I Improve Word Recognition?

QUESTION

I have spent a great deal of time teaching reading comprehension this year, presenting story summaries and questions to direct my fourth-grade students' reading and conducting discussions of the stories they have been assigned. Despite all my efforts, my students have shown little improvement on the comprehension section of the reading achievement tests. Although at this level I am expected to concentrate more on comprehension, I find that my students are having so much difficulty with word recognition that it interferes with their comprehension. They do not read fluently when I have them read aloud; they stumble over words and they have difficulty even trying to pronounce some words. Is it advisable to go back and attempt to improve their word recognition skills before continuing to work on comprehension?

We have several recommendations: First, we strongly recommend continuing efforts to improve word recognition skills. Second, we do not recommend teaching word recognition skills instead of comprehension skills, as the teacher's question implies. Third, we recommend that content area information (e.g., social studies, science, and mathematics) be provided for poor readers who may not be able to acquire it themselves from grade-level texts. Teachers may do so by using materials that are written at a lower grade level or by providing instruction orally, by audio cassette, and so on.

Research has demonstrated the importance of word recognition skill for overall reading performance. Observations indicate that at about the fourth-grade level, reading materials begin to get much more difficult, and students are expected to acquire new information by reading. The need for accurate and rapid word recognition becomes greater under these circumstances. For these reasons, we recommend an emphasis on word recognition skills for students who are having difficulty. In addition, we recommend continued instruction in comprehension in all content areas. Students should be instructed in all subjects while working at improving word recognition skills.

Should I Concentrate on Syllabication?

QUESTION

My fourth-grade students have not acquired ac-

curate and rapid word recognition skills. Would it help to teach them the basic syllabication rules (like VC/CV) and then give them a lot of practice using the rules in such materials as worksheets or activity cards? Will learning syllabication rules improve their reading?

Research indicates that teaching rules of syllabication is not a useful technique for improving word recognition. There are so many exceptions to the rules that such instruction may actually cause confusion rather than reduce it.

Reading with good comprehension requires development of strategies for recognizing multisyllabic words. There is growing research evidence that as reading skill develops, students read in larger sized units, progressing from single letters to letter clusters and then on to words and phrases. The demands of reading are so great that if readers do not progress to perceiving in larger units, it is unlikely that they will be able to understand or remember what they have read.

Although we do not advocate teaching syllabication rules as a technique for recognizing multisyllabic words, we want to stress the importance of developing strategies that enable students to develop this skill.

awareness is an important component of any prereading program.

Many educators and researchers view reading in relation to speech and language. They suggest the children must learn to associate spoken words with their corresponding written forms in order to learn to read. Some go a step further and note that spoken words are actually made of individual sounds (phonemes), which correspond to letters (graphemes), in words. Those who analyze reading into letter-sound or grapheme-phoneme correspondences usually advocate that children become sensitive to these features of spoken and written language prior to or very early in learning to read. How can children be taught this very abstract concept when they are so young?

Research indicates that young children can be made more aware of the parts of spoken words through exposure to various kinds of language activities. One common example is rhyme. Rhyming one-syllable words involves mentally separating the initial phoneme from the word, leaving the remainder of the word intact, and replacing it with a different initial phoneme. Thus, when you ask children to tell what rhymes with *dog* and they respond with *bog*, *hog*, or *log*, they are indicating an awareness of the

. . . children must associate spoken words . . . with written forms . . . to read.

How Do I Prepare Kindergarteners to Read?

QUESTION

I supervise primary grade and kindergarten teachers in a school district serving a low income neighborhood. This spring and summer we are going to revise the kindergarten program. Our primary goal is to do the best possible job of preparing the students for reading. We now have a kindergarten curriculum that we think is quite rich in language activities. Are there specific language skills that we ought to emphasize—skills that are so critical that children would have great difficulty learning to read without them? If so, what activities foster the development of these skills?

Kindergartens now are places of formal and systematic prereading instruction. Kindergarten children tell and are told stories, letters and letter names become familiar, written words are used to label common objects in the classroom, and writing is often encouraged. This includes knowing what reading is; knowing conventions of print such as reading from left to right, top to bottom, one line at a time; and knowing the concepts of a letter, word, sentence, or story. Development of this linguistic phonemic structure of our language.

Another activity in the same category as rhyming is sorting by initial (or final) sound using objects, pictures of objects, and spoken words. A more difficult activity involves the deletion of a sound anywhere in a word, such as *meat* without the /m/ sound, *beef* without the /f/ sound, or *camp* without the /m/ sound. There is research suggesting that children who are poor readers often cannot perform these phoneme-level skills. We think that teaching young children these skills is likely to improve early-grades reading achievement.

Is Letter Name Knowledge Important?

QUESTION

I have been a teacher in the same district for eight years. Over the years I have taught first, second, and fourth grades; now I teach kindergarten. The kindergarten curriculum lists a number of skills that children should be taught to prepare them for formal reading instruction in the first grade. Knowledge of the letter names is one of the skills listed. How important is it for kindergarteners to learn the letter names? Will it make learning to read easier? Will they

become better readers? I had poor readers in the other grades I've taught, and I know that most of them knew the letters of the alphabet. I have so much to teach in one year—if this skill doesn't help with reading, then I'll just skip it. What should I do?

Activities which teach letter names form part of the rich and varied language environment that seems to produce better readers. Young children are proud of their letter name knowledge, and we think that it is a good idea to provide kindergarteners with a sense of accomplishment. Most important, the letter names should be taught during kindergarten because letter name knowledge is necessary for communication between the teacher and the students during reading and language instruction.

QUESTION

The kindergarten and first-grade teachers in my school district meet regularly to plan and share ideas. During our last meeting, one teacher raised a question about the benefits of visual perceptual training to beginning reading. We realized that we are confused about this area of instruction, yet most of us have used materials from time to time that purport to improve visual perceptual skills. Are visual perceptual activities likely to be helpful to students in the early stages of learning to read? If so, are some activities more helpful than others?

Visual perceptual training usually begins by having children discriminate among geometric or abstract shapes. Tracing, completing mazes, copying designs using blocks, and stringing beads according to patterns are other activities commonly included in visual perceptual programs. In some programs, children also learn to discriminate, recognize, and produce the letters of the alphabet.

Research does not support the contention that visual perceptual training which uses nonalphabetic shapes facilitates early reading, but, perceptual activities that involve letters and words are related to reading and writing and should be a part of prereading or early reading instruction. But, because most students master them early, these visual perceptual skills should not be a major emphasis of the early reading curriculum.

Should I Use *Sesame Street* to Teach Reading?

QUESTION

I am the reading and language arts teacher in a kindergarten and primary grades team. Recently, we have been thinking about incorporating Sesame Street *and* The Electric Company *into our reading instructional program. The district's curriculum coordinator has asked the team to justify the use of television in the curriculum. We know the students enjoy the programs, and we have heard that watching the shows improves reading. Can you give us some specific information? Does watching shows like* Sesame Street *and* The Electric Company *really improve reading? How should these TV shows be used for reading instructional purposes?*

Cookie Monster, Big Bird, Easy Reader, and Letterman are apparently good teachers. Research results have demonstrated that large numbers of children are watching *Sesame Street* and *The Electric Company* and that the frequent viewers show greater gains in reading and prereading skills than their nonviewing peers. Research results therefore support the practice of using these shows in addition to the traditional classroom reading program and suggest that related follow-up activities will enhance the show's effectiveness. It is extremely important, however, that teachers carefully evaluate the skill level of each child before including *Sesame Street* or *The Electric Company* in the reading instructional program. If the skills being covered on a given program segment have already been mastered by individual students, we think that alternate instruction during viewing time would be more advantageous for them.

Cookie Monster, Big Bird, Easy Reader, and Letterman are apparently good teachers.

What Good Are Reading Readiness Tests?

QUESTION

I teach first grade. Every spring a readiness test is administered to the kindergarten students, and I receive the results in preparation for teaching them in the fall. I try to plan instruction to meet the individual needs of my students, but, frankly, I do not know how to use readiness test scores for this purpose. Of what use are reading readiness test scores? I have heard that readiness test scores are predictors of later reading achievement. What exactly does this mean?

Reading readiness test scores can be used to predict reading achievement, but in general these scores are no better as predictors than teachers' judgments, mental ability test scores, or even scores on tests of numerical concepts. Because of the nature of most reading readiness tests, they probably are not useful for diagnosis of specific skill deficiencies or for planning the precise course of instruction. These decisions are made more reliably on the basis of children's actual prereading and reading classroom performance. For this reason we recommend selec-

tion of readiness tests with formats that closely approximate the classroom learning situation. Selection of a readiness test that includes measurement of phoneme analysis skills is also advised. Along with other sources of information, reading readiness test scores can be used to make tentative decisions about grouping for classroom instruction, and they can be helpful in identifying children who may have trouble learning to read and would benefit from early intervention.

Can Stress on Decoding Hamper Comprehension?

QUESTION

I am a second-grade teacher, and I have used several different approaches and sets of materials for reading instruction during the ten years that I have taught. In recent years I have been concentrating more on phonics. With all the talk about poor comprehension and declining achievement test scores, I am worried that by stressing decoding I may be hampering comprehension. I would like to know the best combination of decoding and comprehension instruction for developing proficient reading during the first three grades.

ingful and enjoyable materials. Make sure that students learn to identify and use new words in context.

- Inform students that the purpose of reading is comprehension and that working on decoding and learning to recognize words rapidly will help comprehension.

Should I Use Phonics or Language Experience With First Graders?

QUESTION

I teach in a school that serves mainly low income students. Typically, I begin the school year by having my first graders tell, write (I take dictation), and listen to a lot of stories and share experiences. My neighbor, who also teaches first grade, criticizes me for this practice. He says, "Phonics instruction is the only effective way to teach beginning reading." I think that the language experience approach helps my students to read, but I wonder whether it ought to be used exclusively for teaching reading? If not, would it be helpful to combine language experience with phonics?

. . . code teaching is recommended in beginning reading . . .

Although we cannot provide a formula for balancing decoding and comprehension instruction in the early grades, we do recognize the critical importance of automatic decoding for comprehension. Therefore, we suggest that decoding be a primary objective of early reading instruction. This view does not exclude attention to comprehension—instruction can stress both decoding and comprehension. We hope these examples will make our view clear and that they will suggest other instructional procedures to you.

- Make decoding instruction meaningful, that is, with a predominant use of real words. Intersperse practice on words with practice on decoding syllables. We suggest use of only those syllables that obey the spelling rules or patterns of the language.
- Be sure students demonstrate that they understand the materials they decode. Ask them questions about what they have read, have them read material that requires the students to follow directions given in the material, have them act out stories, and so on.
- Give students a lot of practice reading books, magazines, and so forth, that are appropriate to their reading level. Provide students with ample opportunity to apply their decoding skills to mean-

The research results currently available suggest that an initial instructional emphasis on the alphabetic code results in good word recognition skills. Based on this evidence, code teaching is recommended in beginning reading instruction. The language experience approach appears to be as effective a means of teaching initial reading as the traditional whole word of basal method and could be incorporated as part of a total early reading program.

Given the present state of research on the language experience approach, we can draw only tentative and limited conclusions about its effectiveness as a method of reading instruction. The research comparing methods of instruction has some serious difficulties. For example, results of research often reveal greater variability within one method of instruction than between different methods. Moreover, the teacher and the quality of instruction appear to affect reading achievement more than the particular method used to teach reading. Results such as these make it very difficult to offer research-based suggestions for evaluating the language experience approach.

The language experience approach is not as thoroughly researched and evaluated as code-based methods. Therefore, until results based on more comprehensive research are available, we cannot make definitive statements regarding the most effective

use of the language experience approach in the elementary classroom.

What Kind of Questions Should I Ask?

QUESTION

I am a curriculum specialist for the elementary grade teachers in my school district. Our major goal in reading instruction for the next school year is to improve student's abilities to comprehend what they read. What recommendations should I make to teachers for developing questioning strategies as a means of helping students comprehend reading selections? What kinds of questions should be asked? When and how should they be presented?

We recommend that teachers ask all kinds of questions of students at all grade levels. The kinds of questions asked—literal, inferential, interpretive, evaluative, etc.– should vary with the particular purpose or goal of comprehension.

We certainly would not recommend the practice of asking only literal questions. This practice could mislead students into thinking that the only purpose of reading (at least in school) is to be able to answer factual questions. This, in turn, might lead them to focus only on the details of selections; they might miss the major points and never really think much about what they read.

We recommend that teachers ask all kinds of questions . . .

Will asking students higher level questions promote more and deeper understanding of materials? If students are asked, for example, to answer inferential questions about events in stories, they will have the opportunity to demonstrate that they can understand underlying meanings. Such higher level questions stimulate students to think about them at the different levels required by the questions.

We do not have strong evidence that modeling question-asking will aid students' comprehension when there is no teacher to ask the questions, but we think it will help.

Prequestions seem to increase the likelihood of students' learning the specific information which will correctly answer the questions. Postquestions are preferable if the students are to learn more generally the content of what they have read. Because the body of research on how this questioning technique works with younger students is still quite limited, we must be cautious in our recommendations. However, from our present information, it appears that, for children as well as adults, postquestioning facilitates learning to a greater degree than prequestioning.

Do My Students Need Test-taking Skills?

QUESTION

I am a reading specialist in a large urban school district. We have really concentrated on improving students' achievement in reading during the past several years. In general, our primary level students' reading achievement test scores have improved in the areas of word recognition and vocabulary, but there has been very little improvement in their reading comprehension test scores. Our reading coordinator has suggested that we add to our already crowded curriculum a program to teach "test-taking" skills. Will teaching our students these skills improve their reading comprehension?

Scores on reading comprehension achievement tests reflect students' abilities to take tests as well as their comprehension skills. There is some evidence that test scores can be improved somewhat by preparing students for testing situations. Exercises that reproduce the format, instructions, and time constraints of standardized achievement tests should reduce anxiety and make students more test-wise. When students perform at their best on tests, teachers have more accurate information about comprehension skill levels and a better basis on which to plan instruction. (See also *Noteworthy* article, "Inside Tests," Summer 1981.)

Are Tape-Recordings or "Neurological Impress" Methods Useful?

QUESTION

I am a reading specialist working with fifty students in grades four through eight. Their reading achievement is at least one full year below grade level, as measured by reading achievement tests, and most are two or three years below grade level. Although the range of reading skill within this group varies, most of the students have difficulty recognizing words in a systematic way. Despite the fact that I spend considerable time teaching these skills, I feel that I am not doing enough. I have heard that having a child read the text while listening to a tape-recording of it improves reading skill. Is there any evidence to support this technique?

I have another question. I recently attended a meeting where something called the "neurological impress" method was presented. The guest speaker described the method (the teacher sits behind the student, reading aloud as the student reads) but was not very specific about how to use it or with what kinds

of students it would be helpful. In many ways this method seems similar to using tape recordings. Is it, in fact, much the same? Has the neurological impress method been effective in helping students become more fluent readers?

Research evidence on the use of the repeated fluent readings as a model for students, either in the form of tape-recorded stories or neurological impress, is inconclusive. Some studies report positive results. Several explanations for the success of the method are offered: pairing auditory and visual information, repetition, and exposure to the rhythms and patterns of language. We note that the neurological impress method has the added positive feature of individual attention from the teacher.

However, some researchers do not report success with this method. They claim this is due to the fact that this type of simultaneous presentation of auditory and visual stimulation is confusing. Practically speaking, the neurological impress method has some serious drawbacks—it is demanding and time-consuming. Furthermore, no evidence exists that use of the impress method actually leads to neurological changes in the brain.

. . . being accurate at word recognition is not enough.

What's Causing My Students' Reading Comprehension Problems?

QUESTION

I have several students in my combined fourth/fifth grade class who have reading comprehension problems. When I have them read aloud, they can recognize most of the words, but they do not seem to understand or remember what they read. What do you suppose the source of the problem is?

Among the major components that enable good reading comprehension to occur are word recognition skills, vocabulary knowledge, syntactic skills, and background knowledge. If any one of these components is not well developed, or if each is developed but not automated or well integrated, then the result is likely to be reduced comprehension. We discuss below the components and their importance for good reading comprehension.

- Word Recognition

We support the position that being accurate at word recognition is not enough. Readers must also be able to recognize words rapidly with virtually no effort.

We speculate that many of the students who are able to recognize words but do not comprehend very well suffer from being slow and nonautomatic at word recognition. Researchers recommend that practice using easy reading materials with the specific instruction to read faster should promote rapid and automatic word recognition.

- Vocabulary

Some readers have inadequate vocabulary skills in addition to (or instead of) word recognition difficulties. A student who does not understand the meaning of key words in a sentence probably will not understand the sentence. Vocabulary is not easy to increase, especially if word recognition skills are poor. Poor readers at the elementary school level usually cannot or do not read materials where the content is advanced enough to contain unfamiliar words. We think teachers can help these poor readers by giving them direct vocabulary instruction by reading to them from advanced materials that the poor readers cannot read themselves.

- Syntax

Syntax governs the way words and phrases are combined to form sentences. In oral language, speakers demonstrate their knowledge of syntax by speaking with the proper phrasing, intonation, expression, and so on. In the case of written language, punctuation marks, word order, and verb tenses are the only overt syntactic clues available to readers.

Some research indicates that students who seem unable to read with the proper phrasing can improve in comprehension by reading written materials that actually have been grouped into phrase and clause units. We do not know whether practice with such materials will improve reading of new ungrouped passages. But we do know that this research suggests that syntactic skill is related to comprehension.

- World Knowledge

Another kind of knowledge is important to comprehension—world knowledge. By world knowledge we mean that everything we already know is helpful in acquiring new knowledge. If we can relate new information to something we already know, then it is easier to understand and remember.

Teachers and parents can help children accumulate world knowledge by exposing them to many varied experiences. Of course, as reading skills develop, reading itself is a tremendous source of new information and, consequently, a large contributor to an individual's world knowledge.

MATH THAT REALLY ADDS UP!

by Mark J. Driscoll

What reading teachers face in making reading decisions, teachers of mathematics also face. Although they may use teachers' guides, district curriculum sources, or co-workers for advice, they, too, avoid the research literature—often because it is obscure, unavailable or not directly related to their concerns.

Research Within Research—Mathematics bulletins were designed to bridge that gap. Here are selected excerpts from CEMREL's bulletins on math diagnosis, motivation, text use, and word problems.

How Do I Diagnose Math Problems?

QUESTION

At the start of every school year I am faced with the same concern: What do my students know? Where are each student's weak and strong areas in mathematics?

Include "diagnosis" in a word association game and you invite immediate responses of "doctor," "illness," and the like. It is natural, then, that when you restrict the word to a mathematics classroom there will be a tendency for teachers to associate "diagnosis" with learning sickness and remediation.

There is no doubt that the teacher who is adept at diagnosis is a person with a keenly developed eye for persistent trouble spots in a child's mathematical growth, a deft touch in probing for the causes of the trouble, and, possibly, an awareness of ways to deal with deficiencies. But if the target focus is widened, if the teacher sets out in the beginning of the school year to assess each child's mathematical strengths, as well as weaknesses, then there will be additional pay-offs for both teacher and child.

The research literature lends support to your giving mathematical diagnosis a double scope—strengths as well as weaknesses. Indeed, in cases where weaknesses have been isolated, researchers recommend that you involve the student in planning work in the weak areas. A firm foundation for this involvement lies in acknowledgment of the student's areas of mathematical strength by both teacher and student. For example, a child who has trouble with the steps of a multiplication algorithm may be competent in estimation. Another child who is weak in recalling basic facts may have developed impressive counting strategies to compensate. Building on skills such as these, teachers can help students deal with their deficiencies in mathematics—by making sure, for example, that the child who estimated well recognizes the value of her skills and that she has time, and takes time, to estimate before each multiplication exercise.

There are several ways in which you as teacher can take your students' mathematical pulse, and the range of options can fit any personal style or classroom design. Loosely categorized, the ways of classroom diagnosis are observation, personal interview, and paper-and-pencil testing. Observation and interview can reveal child behaviors not noticeable from paper-and-pencil tests, while testing, on the other hand, will sometimes provide more convenience and a wider range of investigation. Thus, some blending of the three formats often makes good sense.

At this point, we list research guidelines for diagnosis in elementary school mathematics, including references to articles and books you might find helpful in organizing diagnostic interviews and tests.

Developmental and Motivational Factors

- Make sure that a child's apparent mathematical deficiency is really a deficiency. For example, Riedesel found many children who did not know basic addition facts but who did know basic multiplication facts. The evidence indicated that the typical attitude was that there is not much time saved in memorizing $9 + 8 = 17$, but it takes too long to figure out $9 \times 8 = 72$, so the child memorizes that fact. Thus, what appeared to be an inability to memorize basic facts turned out to be no such thing.
- Remember, furthermore, that each child progresses through several stages of development before reaching an adult conceptual level in mathematics. Occasionally you may see a seven-year-old child who shows a better sense of number, for example, than an eight-year-old classmate, for the sole reason that the younger child has developed faster.

A comprehensive source of information on the mathematical development of young children, with practical classroom suggestions, is *Mathematics Learning in Early Childhood*, the National Council

Research Within Reach—Elementary School Mathematics was developed by the Research and Development Interpretation Service (RDIS) for the Research Development Exchange (RDx), CEMREL Educational Research Laboratory, St. Louis.

of Teachers of Mathematics (NCTM), 37th Yearbook, 1975.

- Strengthen your diagnosis, whether from observation, interview, or testing, with the liberal use of manipulatives. The value of manipulatives extends far beyond the bounds of diagnosis, but in light of the role that development plays in diagnosis, it is important that you assess a child's understanding of a concept or operation at concrete, pictorial, and abstract levels.

For example, suppose the following type of subtraction error appears regularly in a child's work:

$$\begin{array}{r} 54 \\ -29 \\ \hline 35 \end{array}$$

If you are left unsure whether its root cause is carelessness, a lack of understanding of the base-ten numeration system, or even a lack of understanding of the concept of subtraction, then it would be advisable for you to ask the child to represent a similar exercise with base-ten blocks (or bundles, rods, an abacus, etc.). The problem then becomes one of removing 2 tens blocks and 9 ones blocks from the total of 5 tens blocks and 4 ones blocks. The child's manipulation will give you a much sharper focus on her thinking.

This willingness and readiness to ask "Can you show me without using a pencil and paper?" or "Can you show that with a picture?" is a powerful diagnostic ally throughout the elementary school years, and, indeed, beyond.

- Don't lose sight of the emotional side of students in your diagnosis. Denmark relates his experience with a fifth-grade child, presumed to have no understanding of division, even on the concrete level, who became a division dynamo when Denmark persisted in his diagnosis and introduced a game involving division. His assessment was that the child's needs probably lay in the area of motivation. This example illustrates a crucial component in diagnostic teaching—you must be both flexible and patient in piecing together an accurate picture of a child's thinking.
- A second, equally crucial, component is a climate of acceptance. Effective diagnosis requires two-way communication, and a child is unlikely to cooperate in revealing his thinking unless he perceives not only that you are willing to help him, but that you stand ready to accept his failures and incorrect responses without criticism. Examples of games with diagnostic potential can be found in *Didactics and Mathematics* from Creative Publications and *Arithmetic and Learning Disabilities: Guidelines for Identification and Remediation* by Stanley W. Johnson.

Diagnostic Testing

Models for diagnostic tests in mathematics can be found in *A Guide to the Diagnostic Teaching of Arithmetic* by Fredrick Reisman and "Classroom Diagnosis" by Robert Underhill in *Remedial Mathematics: Diagnostic and Prescriptive Approaches*, (ERIC/SMEAC, 1976). Reisman also includes guidelines for designing your own diagnostic tests. However, if you do set out to design your own diagnostic test, consider the following points:

- Take care to construct exercises that will allow you to distinguish basic facts ignorance from algorithm difficulty. For example, James Inskeep's *The Math Teaching Handbook* provides a series of exercises intended to test understanding of multidigit multiplication. For the design of the exercises he stresses the importance of control over the basic facts involved. As an example, one might avoid using 7, 8, or 9 as digits, thus bypassing the basic facts most students find most difficult and clearing the way for the teacher to judge the degree of each child's mastery of the multiplication algorithm. Inskeep further recommends giving a basic facts test before your diagnostic test, including only those facts used on the diagnostic test.
- Distinguish, in your diagnostic evaluations, between computational errors that are random and those which occur more systematically. Systematic errors are more deeply rooted than random errors, as the Linda Cox article, "Diagnosis and Remediating Systematic Errors in Addition and Subtraction Computations" in the February, 1975, *Arithmetic Teacher*, illustrated. Her report stated that 23 percent of the children she tested who were making systematic computational errors were still making the same or very similar errors almost one year later. In her study she defined a systematic error as one which occurs "in at least three out of five problems for a specific algorithmic computation."

Despite the tendency of systematic errors to stick with a child for a long time, it appears that remedial intervention can hasten their elimination. It will pay you, therefore, to make the effort to isolate them. The example below shows evidence of a systematic error:

$$\begin{array}{r} (1)\ 476 \\ +\ 17 \\ \hline 25 \end{array} \qquad \begin{array}{r} (2)\ 205 \\ +\ 86 \\ \hline 21 \end{array} \qquad \begin{array}{r} (3)\ 754 \\ +\ 28 \\ \hline 26 \end{array}$$

The answers above come from adding up all the digits in the addends—e.g., 25 =4 + 7 + 6 + 1 + 7.

As you work to make yourself more alert to systematic errors, you may find it helpful to read Backman's article, "Analyzing Children's Work Procedures," in *Developing Computational Skills*, the NCTM Yearbook, 1978, in which he provides a list of computational errors and thought patterns of children which may enrich your own diagnostic observations. In particular, he analyzes error patterns by attending to:

1. Errors related to conceptual learning:

$$\begin{array}{r} 402 \\ \times\ 6 \\ \hline 2472 \end{array}$$

   The student believes $6 \times 0 = 6$.

2. Errors related to sequencing steps within procedures:

$$4\overline{)418}\quad 142$$

   The student reversed the role of dividend and divisor in part of the division.

3. Errors related to selecting information or procedures:

$$\begin{array}{r} 53 \\ \times\ 2 \\ \hline 105 \end{array}$$

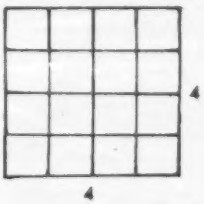
   The student used an addition fact, $2 + 3 = 5$, within the multiplication procedure.

4. Errors related to recording work.

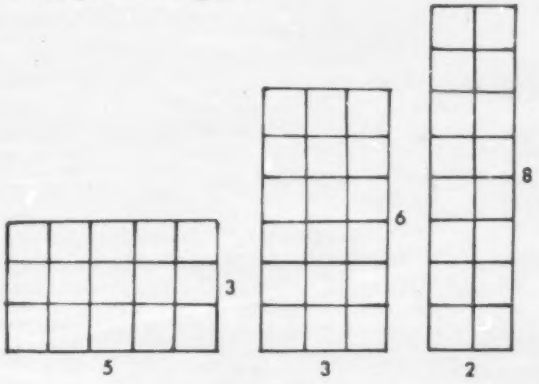
As you develop skills in recognizing systematic errors and the thinking patterns that produce them, it is important to consider why children learn patterns of error. There is no one cause, but a major contributing factor appears to be the premature introduction of a child to paper-and-pencil procedures while he still needs to be working with concrete aids as pointed out by R. B. Ashlock in *Error Patterns in Computation*.

Other Diagnostic Concerns

- Be concerned, in your diagnosis, with mathematical areas which are not primarily computational. For example, the last National Assessment of Educational Progress (NAEP) in mathematics included a test exercise in area:



Which of the figures below has the same areas as the previous figure?



Those who reported on the NAEP results concluded:

Thus, it appears that most 9-year-olds do not intuitively recognize the consequences of partitioning regions into units of measure. This principle is one of the first that must be mastered for any subsequent work on measuring area to have any meaning.

The diagnostic value of such exercises becomes clear: if you as a teacher do not take pains to see if partitioning by units makes sense to your students, then you may be left, at best, with mere rote learning if you decide to move on to procedures for calculating areas.

Diagnostic Interviews

- Use individual interviews whenever your observation or diagnostic testing leaves you confused about a particular child's mathematical thinking. In the recommended format, teacher and student meet together away from the rest of the students, but not necessarily out of the classroom. The student works through a set of exercises and is asked to make clear her thinking, out loud, either while she is working or after the work is complete.

Be as unobtrusive as possible when you interview, limiting your interventions to ensuring that the student does clarify her reasoning and strategies. The interview is not a teaching exercise, so you should ignore "Is that right?" questions from the child and also avoid nonverbal, as well as verbal, signals to the student. Adapt your pace of interviewing to the pace at which each child is comfortable responding, allow the child to use her own language, imprecise though it may be, and be ready to stop an interview as soon as the child shows anxiety, rebelliousness, or boredom.

Prerequisites

Once your diagnosis has helped you to isolate a concept that a particular child doesn t understand or a skill she hasn't mastered, and before you embark on remedial work, it is necessary to do some tracing back to assess where the understanding became faulty. There are a number of available lists or prerequisite hierarchies for elementary school mathematics; one such list can be found in the Reisman book mentioned before.

However, it is possible for you to do some tracing back on your own. To generate your own list of prerequisites for a particular skill or concept, you need to give careful thought to the question, "What would a student need to have learned in order to understand this concept (or have this skill)?"

For example, if you have concluded that a student doesn't understand place value tasks involving hundreds, tens, and ones, then the answer to the above questions might involve 4 steps. The student would need to have learned to:

1. be able to order numbers from 100-999
2. interpret place value of a three-place numeral
3. write numerals in the hundreds
4. exchange tens for hundreds and hundreds for tens (e.g., 17 tens is 1 hundred, 7 tens).

When you have done this, it is possible to assess the child's understanding of each of these prerequisites, and to carry on, if necessary, the process of tracing back.

Conclusion

Diagnosis, properly done, can be a powerful teaching ally. With it, you can draw a profile of each student for areas of possible weakness, areas of consistent weakness, areas of transitional growth, and areas of actual and potential strength. Then, as you face each child's individual needs, you will be better armed to meet those needs.

How Do I Motivate?

QUESTION

I am a sixth-grade mathematics teacher, and I need help in approaching the remedial needs of some of my unmotivated students, who are three years behind in skills. How can I motivate them to be interested in catching up while at the same time motivating the more successful students to work at their full potential?

Lighting fires of interest in mathematics and getting students to take strides for themselves—these are familiar tasks for many teachers. There are no shortcuts to motivation, no quick formulas or programmed inducements. There are, however, some suggestions from research and from the experiences of teachers who have had some success in motivation. Here we present some of these suggestions, with an eye particularly toward the elementary school mathematics classroom.

First, however, a cautionary note is in order. At times the attention given to motivation may be misguided, while at other times it may be altogether insufficient. If Greg, for example, is disruptive or seems to forget basic mathematical facts too easily, his problem may be different from—and even more serious than—a lack of motivation. He may be learning disabled or developmentally immature. On the other hand, Marie may be regular in homework, cooperative in class, and willing to contribute her computational answers, all in apparent stark contrast with Greg. And yet Marie's need for increased and enriched motivation—for example, to improve her estimation and problem-solving skills—could be just as great as that of any student in the class. Without such motivation, her interest in mathematics may begin to evaporate very quickly in junior high school, as indeed it does for many girls as pointed out by Lynn Fox, Elizabeth Fennema, and Julia Sherman in *Women and Mathematics: Research Perspectives for Change* (National Institute of Education).

The suggestions we present are grouped under two headings, reflecting two separate, though related, vehicles for creating a motivational environment in the mathematics classroom: approaches to mathematical learning and teacher-student communication.

Approaches to Mathematical Learning

- Enrich your mathematics curriculum by weaving in regular work with estimation strategies, problem-solving, manipulatives, challenging drills, and so on. One research recommendation worthy of note, namely that teachers can and should expect students to enjoy the learning of mathematics and should make that expectation evident, comes from Jere E. Brophy and Thomas Good in *Teacher-Student Relationships: Causes and Consequences.*

Besides the curriculum enrichment just noted, one recommended way to make the expectation evident is to prepare and systematically use questions that are an invitation to think, not just tests of memory. Thus, while "How many 9's in 81?" has a place in your repertoire, so should questions like, "Can you see a pattern in those numbers?" It is important that children learn that teachers are interested in what they have to say and are not just hunting for the right answers.

In a similar vein, encourage student-initiated questions. The value of this teaching strategy was confirmed in two studies that measured its effect on

student achievement. From one of the same studies comes the further recommendation that you accept questions in the form they are asked. You may, for example, see some value in translating a question into more precise mathematical language, but it is apparently more important for the child to experience your acceptance first. The translation can come later, after you have made it clear that you value his asking the question.

Teacher-Student Communication

Here emphasize teacher-student communication which is less connected to the body of the mathematics curriculum and to the flow of mathematical questions and answers, but is still vital to student confidence, interest, self-concept, and persistence, that is, to student motivation.

The importance of the work you do with each student, individually, to establish realistic, short-term goals is a strong point made in James Pearson's "A Favorable Learning Environment" in *The Slow Learner in Mathematics*, the NCTM 35th Yearbook, 1972. One motivation project showed that spending ten minutes a month talking with each individual child about his goals can produce dramatic results in learning. Such goals can run the gamut from those which are incidental to learning—for example, if the child would like to start being active in class, encourage her to speak up once each class—to specific learning objectives—for example, aspiring to mastery of addition with three-digit numbers.

State clearly during each of those sessions that you expect a commitment on the part of the student to strive for the goal(s). The motivational importance of such statements has been demonstrated. For your part, if you seek commitments from students, it is vital that you also:

- Make clear to each student, especially the less successful students, that you will be supportive of them through failure situations. For example, your consistent waiting for responses and helping to draw out responses before you move on from one student to another is apparently important in the development of a student's confidence.
- Conduct regular (daily, if possible) and careful evaluations of each student's progress toward his goals, and keep the student aware of the progress as in Edward Davis' "Suggestions for Teaching the Basic Facts of Arithmetic" from *Developing Computational Skills*, the NCTM Yearbook, 1978. In one recommended procedure, the teacher and student maintain a progress chart, record on it daily, and check it regularly.
- Provide a climate in your classroom in which risk-taking is perceived as acceptable. One characteristic of a low self-concept is a reluctance to take risks, and you can provide experiences in which risk-taking is both safe and interesting. For example, you can encourage educated guessing. ("How big a number do you think the answer will be?" "Can you guess a rule for this?") Allow a number of guesses each time you suggest guessing, record them all, and give them comparable consideration in the final determination of the answer. Both you and the students can learn much from incorrect answers.
- Be liberal and regular with positive reinforcement for risk-taking, thoughtful guessing, and perseverance. Several studies have recognized the importance of public acknowledgment of success, especially for low-achieving students as they experience success or progress in group situations.
- Finally, as the child's confidence and self-concept begin to grow, it is important that you not only acknowledge success but also encourage him or her to take credit for individual success.

Conclusion

Several extensive studies have revealed that students frequently discern unspoken teacher expectations, and that those unspoken expectations can mold both teacher and student behavior in the classroom. If the expectations are inappropriate (for example, "Charles' hesitation in answering always creates tension in the class"), then the resulting behavior will quite often stand in the way of student motivation (Charles is effectively denied the opportunity for public participation).

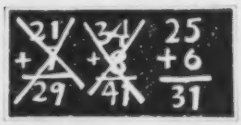
The teacher's potential for affecting student motivation, positively or negatively, is awesome. While, in the end, motivation must come from within each student, it can only come when the student feels the excitement of learning, experiences his or her efforts as appreciated, gets some clarity on goals, makes some connection between the work done in mathematics class and those goals, and feels the confidence and freedom to risk attaining them.

Is the Textbook Enough?

QUESTION

Our current text stresses drill, and I am afraid my students will get shortchanged in understanding. In which directions, and for which topics, should the text be supplemented?

It is important to keep textbooks in perspective. By themselves, they have little power to motivate problem-solving instincts and skills. A good text can contribute to such growth, but the power to make



it happen must come from the teacher.

Answers to teacher questions about textbooks depend upon the texts and the students involved. You must be the final judge in deciding if and when your text is missing the mark on a particular topic. Recent research, however, has drawn some conclusions and made some recommendations concerning the use of textbooks in elementary school mathematics, making it possible to approach questions on textbook use with a more analytic eye. Here we do that by looking at current textbook design and usage, at some textbook pitfalls and weaknesses that can be anticipated, and at sources of advice for teachers in the wise use of texts.

Textbook Use

Research surveys and analyses of mathematics textbooks and their use reveal some expected finds, as well as a few surprises. In their survey of the research in the twenty-year span from 1955 to 1975, Suydam and Osborne found that a single text is used in most classrooms and that many teachers use no instructional materials except the textbook and the chalkboard.

The major mathematics texts in use throughout the country are similar in several ways:

> Low-level cognitive processes—knowledge and comprehension—are used far more frequently than high-level processes—for example, problem-solving processes.
>
> An emphasis on computational skills is apparent as shown in James Fey's, "Mathematics Teaching Today: Perspectives from Three National Surveys," in the October, 1979, *Arithmetic Teacher.* There is considerable agreement on grade placement, sequence, and presentation of basic topics.
>
> Of the 32 most widely used mathematics materials, including textbooks, 29 are based on "conventional wisdom" rather than research and development.

Despite the similarities in broad goals and areas of emphasis (for example, whole number computational skills), some significant differences do exist among major textbooks. In particular, there is a wide difference in the total number of concepts treated and the amount of space devoted to various topics. One recent analysis of three widely used fourth-grade textbooks—Addison-Wesley, Houghton-Mifflin, and Scott-Foresman—provided a detailed account of the variance. The researchers first compiled a list of all the mathematics topics covered in these texts. A comparison of the texts disclosed that more than half of the topics on this list are covered in only one of the three texts. For example, ordering mixed numbers appears only in Scott-Foresman, while estimating the fractional parts of pictorial models appears only in Addison-Wesley.

The researchers also found that, even for many topics covered in all three of the texts, emphases vary considerably among the three books—for some topics, the texts vary in the total percentage of exercises involving these topics. And certain topics appear in varying percentages of the chapters in the three books.

In a second study, researchers compared the content of the same three fourth-grade textbooks with the content of several widely used standardized tests: (1) Metropolitan Achievement Tests: Elementary Level, 1978; (2) Stanford Achievement Test (SAT): Intermediate-Level 1, 1978; (3) Comprehensive Tests of Basic Skills: Levels I and II, 1976; (4) Iowa Test of Basic Skills: Level 10, 1978. After measuring how well the tests and texts matched on their respective items, the study concluded that no one test is equally well suited for all of the textbooks. As a matter of fact, some striking mismatches were detected. The Addison-Wesley text, for example, covers less than 50 percent of the items on the SAT. Even more striking is the fact that none of the texts covers as much as 75 percent of the material on any one of the tests. One implication is clear: don't be too quick to assume that standardized tests cover what is being taught, or that your text covers what is tested.

Couple with this variability the fact that textbooks are becoming longer and contain longer sets of exercises—in response to the back-to-basics movement—and, as McKillip and Aviv show in "How to Use, Not Abuse, Those Practice Exercises," in the April, 1979, *Arithmetic Teacher*, the magnitude of the challenge to teachers becomes clearer. In the Houghton-Mifflin fourth-grade text, for example, there are approximately 3200 computational exercises that involve multiplication or division of whole numbers.

Conclusion

It is the teacher, not the textbook, who can best control student motivation and self-concept, who can cultivate the development of logical reasoning through the interaction of students with peers, and who can capitalize on everyday situations and questions to nurture the growth of problem-solving skills. In the hands of an adept teacher, a mathematics textbook can be a vehicle for delivering all those learning experiences, but by itself it is an unsatisfactory, and sometimes unreliable, guide.

How Do I Help My Students with Word Problems?

QUESTION

My third graders score in the satisfactory to high range both in reading and computation. However, they are consistently low in solving word problems successfully. What insight or training can I give them to improve their problem-solving skills?

Adult responses to the phrase "problem-solving" may vary, but for many people it triggers memories, often uncomfortable, of textbook word problems. This misconceived notion—that mathematical problem-solving and word problems are one and the same—is a common one. It pervades the classroom strategies of many elementary school teachers. Word problems are included here, but only as one facet of the development of children as they learn to recognize mathematical structures behind problem situations and as they begin to use mathematical strategies to reach problem solutions.

In studying mathematical problem-solving, researchers have looked carefully at the makeup of problems, at the strategies used by good problem-solvers, and at the behavior of teachers when they teach problem-solving. We focus here on their observations, with emphasis on the elementary school level.

Problem Selection

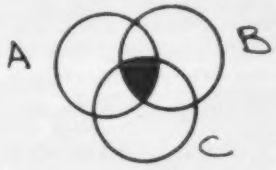
- Provide your students with non-textbook problems and problem settings. The end-of-the-chapter exercises that often come equipped with recipes for solving problems are very limited in the problem-solving growth they offer your students. These problems should be used, but they should be complemented with teacher-written problems. Furthermore, research suggests that you should invite regular involvement of students in the composition of problems. Children derive more enjoyment from original problems, and the process of formulating problems can help children to focus on important details.

As an example of a way to introduce original problems, suppose the text has a series of exercises like the following: "John, Barbara, and Tom went clothes shopping with $18.75. How much will each get to spend if they divide the money equally?" Once the children have had some practice with the textbook problems, you can expand their awareness if you single out several students and say, "Suppose, Bill, Lucy, Jim, and Maria, that you go to the amusement park with $22.00, but $2.00 has to be set aside for bus fare. How much does each of you get to spend at the park, if you divide the money evenly?" After this problem is discussed and worked through, you can challenge the children to compose similar problems.

- Offer your students frequent opportunities to work with problems that yield a variety of solution avenues. For problem-solving skills to develop, flexibility needs room to develop, and too often textbooks present their problems in a manner that suggests there is but one way to solve each type of problem. Multi-solution problems are often difficult to solve, but they form the foundation for lively and profitable instruction in problem-solving strategies. In the following example, making a list to search for a pattern and diagram-making are but two strategies toward solution:

  There are 18 students in this class. Suppose each of you plays one game of tennis with every other person in the class. How many games of tennis will be played?

- Make regular use of problems in which computational accuracy does not have the central role. One danger in the development of problem-solving skills pointed out by Marilyn Suydam and Fred Weaver in *Using Research: A Key to Elementary School Mathematics,* NCTM, 1975, is that children associate problem-solving only with computational accuracy or rote learning. Some examples of non-computational problems follow:



1. The circle marked A contains all numbers from 1 to 50. Circle B contains all odd numbers. Circle C contains all multiples of 7. What's in the shaded region?
2. McKillip and associates developed a program, called "Patterns," for children 3 to 5 years of age. Using blocks or tiles of two colors, the children took on two-fold tasks: to copy patterns made by the teacher and, if possible, to extend the patterns. For example, extend

Despite their age, the children who participated were able and willing to attend to the problems for long periods of time. Once introduced to the world of mathematical patterns, children will respond enthusiastically throughout their school careers to the search

for patterns, provided patterns become a regular part of their problem-solving experience. For more suggestions, see McKillip's "Patterns—A Mathematical Unit for Three- and Four-Year Olds," in the January 1970, *Arithmetic Teacher.*

3. As hand calculators become more available, they provide a ready source for new mathematical problems. Even richer are the opportunities to present problem-solving in a light that doesn't shine just on computational accuracy. As an example, "Using your calculator and any shortcuts you can devise, cross out the numbers that do not belong on the left side of the equal sign:

$$14 \times 3 \times 9 \times 5 \times 8 \times 6 = 3780"$$

Problem-solving experiences like this one from Immerzeel and Ockenga in *Calculator Activities for the Classroom* and Robert Reys, *Key-Strokes: Calculator Activities for Young Students* (Creative Publications), however, become only so much mechanical magic, unless you aid the students, with questions and discussion, in understanding the mathematics that leads to the calculator outcomes. For example after the above exercise is finished, you could ask, "About what number on the left does the zero in 3780 give you the most information? . . . That's right, the five."

The role that calculators can play in the acquisition of problem-solving skills has been the focus of several recent studies. In one sixth-grade study, two groups of students received the same training in problem-solving processes such as estimating, retracing steps, and checking the reasonableness of answers; however, one group used calculators in the training and the other did not. In a final problem-solving test, the calculator group used significantly more of these processes than did the members of the noncalculator group. The conclusion; calculators can help students strike a better balance between laboring for computational accuracy and concentrating on problem-solving strategies.

- Be flexible in representing problems for your students. Research has shown that problems with materials or with visual aids like diagrams are generally easier for children to deal with than those without such aids. Whenever possible, have the children move the materials, make the drawings or diagrams, or even dramatize the problem setting.

Furthermore, if children are given freedom to choose among mathematical models to solve a particular problem, they will select the model that makes the idea most meaningful to them. For example, suppose a problem asks, "Bill takes ½ of a candy bar and Sandy takes ¼ of the same candy bar. How much is left?" A child might find it most meaningful to work concretely, folding rectangular strips of paper, or she might choose to diagram the candy bar and its pieces, or she might be most satisfied changing to the symbolic model:

$$2/4 + 1/4 = 3/4;\ 4/4 - 3/4 = 1/4$$

Vary the wording in problems of the same type. It is apparently easier for students to work through word problems when numerical data are listed in the order in which they are used. Rather than limiting the students' experience to an optimal ordering, however, it would be better for a teacher to change the ordering and wording, perhaps gradually, and to aid the children in relating the wording back to the problem that follows the order of use.

Vary the settings in problems that require the same mathematical operation. Research indicates that there is less payoff for the student in repeated practice with the same word problems using the same techniques, than there is in solving different types of problems with the same technique. For example, the following two problems involving long division would better serve students' needs if they were presented at nearly the same time:

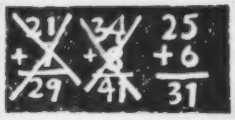
$13.20 is divided evenly among 11 people.
What is each person's share?
Jane drove her car 648 miles in 12 hours.
What was her average speed per hour?

If you were to give your students a series of such problems, it would be important for you to discuss with them the mathematical thread that links the problems together. Otherwise, rote memory might be the students' only recourse for distinguishing among the various problems.

Teaching Problem-Solving

As one takes a hard look at problem-solving, some qualities of good problem-solvers shine through. Seen in the light of the actions problem-solvers take, the strategies they try, the opportunities they grab, problem-solving appears less veiled in mystery, and teachers can begin to plan their instructional strategies. Therefore, as we list each aspect of good problem-solving, we shall pause and make suggestions, some from research, others from the experience of teachers who have had success in teaching problem-solving.

One preliminary observation: teacher questions play significant roles in all of the suggestions that follow. If any backbone for the teaching of problem-solving can be identified, it is this—the consistent



asking of questions that involve students and invite them to think.

Good problem-solvers are quick to understand the important features of a problem, in particular, the objective.

Students should be encouraged to put in their own words what they think the problem is about—the information it provides, the information it seeks. With the amusement park problem cited earlier, you could ask questions like, "Sam, where are Bill, Lucy, Jim, and Maria going?" "How much money do they have?" "How are they getting to and from the park, Julie?"

What role does reading skill play in the development of word problem skill? Research does not seem to point to reading difficulty as the most likely culprit when word problem skills are weak. In one sixth grade study the majority of students who solved problems incorrectly could read the problems orally and even retell the problem stories in their own words. Teachers must be prepared to delve deeper than reading comprehension in their teaching of problem-solving. Zweng urges teachers to develop in students a language for problem-solving, asking frequent questions that are operation-related, such as, "When you put together bunches of the same size, should you multiply or divide?"

When reading difficulties do interfere with students' understanding of word problems, there are several options for the teacher to try. First of all, you can vary the type of problem and its representation (diagrams, pictures, and so on), so that reading comprehension is not so critical to solution. Another strategy is to read the word problems aloud or use a tape recorder.

You can also tie together some reading skills training with work on word problems. Two specific suggestions are that you help your students to learn how to select the main ideas when they read word problems, and that you help them to practice making inferences ("Where are the four children going to get the bus fare?").

It is natural to wonder how helpful training aimed at specific words is. One research study associated progress in solving word problems with training in understanding quantitative vocabulary ("one-fourth," "the seventh," and so on). However, there is also evidence that "emphasis on isolated word clues like 'left,' 'in all,' can be grossly misleading as a problem-solving procedure." For example, it would not be very profitable to instruct children that "in all" means you should add or "left" means you should subtract. Consider the following problem:

> Brian spent a certain amount of money on the first ride at the carnival, and twice as much money on each of the four rides that were left. In all, Brian spent nine dollars at the carnival. How much did he spend on the first ride?

Since young children are easily distracted by the presence of irrelevant information in their environment, the elementary school teacher must be carefully attuned to developmental levels. Teachers should take pains to present problems in a way that highlights their critical features, and to minimize extraneous stimuli or information used just to make material interesting—for example, bright background colors.

Good problem-solvers initiate their approach to problems with less anxiety and with more certainty that they will be able to reach a solution, than do other problem-solvers.

This suggests that teachers should group children for concentrated problem-solving work according to the levels of difficulty they can tolerate comfortably. Several studies showed that children working on word problems in small groups of three or four, when given enough time, solved significantly more problems than those who worked alone. Apparently, then, loosening the stranglehold of time pressure, along with some careful grouping, can do much to relieve problem-solving anxiety in children, and to allow them to develop their problem-solving skills in a way that is both meaningful and comfortable for them.

Teacher questions can do much to boost student confidence that enough information can be drawn from the wording of a problem for a solution to be reached. ("If each student plays one game of tennis with everyone else in the class, how many games will you be playing, John? What about Betty?")

Good problem-solvers can transfer their training from one solved problem to similar problems.

Three suggestions present themselves for your problem-solving instruction. First, before the students tackle a problem, ask them if the problem reminds them of any previously solved by the class. If they make some connections, valid or invalid, discuss the connections they have made.

Secondly, after the students have successfully solved a problem, help them to reflect on the process that produced its solution. Guiding them by questions through a summary can serve this purpose.

Finally, go one step further and cultivate your students' ability to generalize and see commonalities among problems. ("The tennis game problem you just solved is a lot like the handshake problem you

did last week. Do you remember that problem?")

Good problem-solvers are able to evaluate and select from alternative solution routes.

You can encourage your students to suggest, out loud, possible strategies for solution. Acknowledge all of the suggestions, keeping a running list and giving all equal attention. Help the students to compare the various suggestions and point out what kind of approach each represents. (In the case of the tennis problem, you might say, "Okay, Mike, would you like to make a list of the people in the class and begin to count pairs to see if a pattern comes up. That's pattern-searching. Sarah, you want to make a diagram with two columns, each with 18 dots, and to connect the dots with lines. That's an example of diagram-making," and so on.)

Good problem-solvers estimate and approximate well, and, when they get solutions, check to see if they are reasonable.

Estimation is a skill that should have a regular role in your mathematics class. However, in your capacity as teacher of problem-solving, you will find it an especially timely ally when a child or group becomes bogged down in the search for exact numerical answers. ("About how much will each child get to spend at the amusement park? More than $10?")

Estimating can help problem-solvers unravel their thoughts, especially when it is used in conjunction with another technique, problem simplification. At times, problems go unsolved mainly because they involve very large whole numbers or very small fractions, diagrams that have too many lines, or charts that have too many letters. When those situations arise, you should help the students to consider ways to simplify the problem. ("If 18 students are tough to deal with in the tennis problem, pretend there are 4 people or 5 people in the class—that might make things less complicated.")

Provide your students with opportunities to consider and discuss the reasonableness of answers. ("Jane and Mark took an automobile trip. Jane drove 10 7/8 miles, and then Mark drove an additional 15 4/5 miles. About how far did they travel? 25 miles? 27 miles? 30 miles? Which is the most reasonable estimate? Why?")

As you highlight the problem-solving process for your students, make it a habit to ask, "Does that answer seem right? What seems right (or wrong) about it?" Ask questions even when the solution your students reach is correct.

Good problem-solvers learn from their mistakes, and, when answers do not check out, they are flexible enough to switch to alternative approaches.

At this point you can capitalize on your original listing of the suggested solution strategies. However, before the students launch themselves into a totally new direction, you should guide them in looking at the first approach to see how it might have fallen short. Did it yield an answer far too large? Did its diagram get too complicated? You should help them to consider if they can make adjustments in their first approach before they choose a second approach.

Conclusion

Problem-solving in mathematics should not be a part-time endeavor. The kind of teacher questions outlined in the previous sections can be adapted to the entire mathematics program—estimation, checking for reasonableness, learning from mistakes; they all apply to computation, measurement, and mental arithmetic, as well as to word problems. Research has shown for example, that children who are taught thinking strategies for learning basic addition and multiplication facts retain those facts longer and can use the strategies to learn harder facts.

If you apply the strategies outlined here throughout your teaching of mathematics, if you highlight problem-solving strategies whenever you can, your students will be drawn to the conclusion that problem-solving is, indeed, not just a matter of words.

"I DO have a filing system—here somewhere!"

SHOULD BACK-TO-BASICS HAVE A FUTURE?

by R. L. Ferguson

As the back-to-basics movement has spread, so has another concern: that the basics are being too narrowly defined.

In response to this, a group of national leaders in education met in 1977 to analyze the requirements for competence in reading, writing, computing, and other basic skills. Their conclusion: a lot more was involved—and needed—than verbal and mathematical literacy. They came up with concepts of "disintegrating basics and emerging basics; basics that served a static, simple society and spiraling basics needed for the dynamic life of the United States today and tomorrow."

In 1978, leaders of several professional organizations issued a similar statement called *The Essentials of Education* that urged the value of a balanced education—one that did not limit the basics to the three Rs. They stated: "Skills and abilities do not grow in isolation from content. In all subjects, students develop skills in using languages and other symbol systems; they develop ability to reason; they undergo experiences that lead to emotional and social maturity. Students master these skills and abilities through observing, listening, reading, talking, and writing about science, mathematics, history and the social sciences, the arts . . ."

The groups that endorsed *The Essentials of Education* were reacting to the effects of earlier basics movements, i.e., the elimination of many programs that could not immediately or easily demonstrate that they taught children to read, write, or compute.

That is not to suggest that reading, writing, and math are not educational basics, just that they are not the *only* basics.

Barry Beyer makes this point in *Back to the Basics in Social Studies*: "Mastery of the processes of reading and writing seems absolutely essential for student success today. One cannot learn information, inquire about values, engage in intelligent social action, learn about one's ethnic roots, or even succeed in school or in the working world without first being literate—and that means being able to read with comprehension and to write . . ."

Other resistance to the basics movement has come from educators who believe that technological

advances in non-print media and computers will make traditional language arts and math skills obsolete in the future. Beyer disagrees with this by pointing out that basic skills will never be outdated because they are "not mechanical processes but are in reality manifestations of forms of thinking . . . Being able to think clearly, rationally, and coherently seems to be a prerequisite to survival and effective participation in our society, today and tomorrow."

But, will today's thinking skills based on yesterday's basics prepare students for a tomorrow in the twenty-first century? For most of human history, that formula would have worked.

Society has always relied on education to translate its past into its future—a future that was expected to be an extension of the present which was a direct extension of the past. However, in this century, the pace of change hurled society into the future faster than it could anticipate or control. That has led some educators to think that the present curriculum is geared to teach students to function in a

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society that no longer exists.

A dilemma. If we cannot know what the future will be, then how can we teach our youth to function in it? Allain, Violett, and Anselmini speak for the growing number of educators who have accepted the challenge of designing an educational program to meet our present and future needs: "If the schools are to prepare youth for the future, then a future-oriented curriculum would help achieve this purpose . . . It would train students to adjust to a society experiencing a continuing rapid rate of change . . . it calls for educating youth with a heightened future consciousness."

Not an easy task, but one that needs doing. During the past decade, educational futurists, among them McShane, Howard and Franks, Fitch and Svengalis, Brameld, Holstrop, Kaufman, Rubin and Toffler, have proposed restructuring the educational delivery system with a futures view.

At the same time, futures courses and units have appeared in all subject areas and at all levels, although most commonly in social studies. When it was first introduced, futurism went through some trial-and-error: first, as an exploratory phase where the scope, content, objectives, classroom applications, and overall quality were as varied as the individuals who originated them; second, as a defining-refining stage where serious educational futurists tried to establish a set of goals and standardize the content. Then, as futurism began to spread throughout the nation's secondary schools, it ran head-on into the back-to-basic movements and funding cutbacks. Because the subject was new, frequently misunderstood, and not easily justifiable as essential learning, it was a prime target for elimination.

What could have been a devastating blow for futurism has been seized by many educators as an opportunity to bring order to the field, to promote it on the basis of skill development. Franks and Howard in *People, Law, and the Futures Perspective* point out: "Future studies programs can be extremely practical . . . Far from ignoring essential skills, the programs require reading, writing, and thinking."

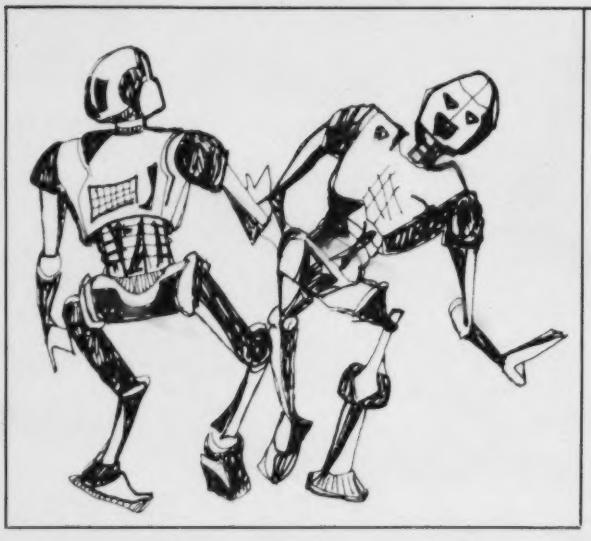
Other concerns have also been addressed. Although the importance of futurism has encouraged the effort to keep and increase the number of separate future studies courses, a companion effort has emerged for futures to work with what's already there. By making futurism more inter- and cross-disciplinary, it can be woven into traditional subjects like math, science, and English. In fact, all disciplines can build a futures perspective by relying on standard content, but refocusing it toward future concerns.

Not just to remain viable, but to expand, futurism must face these harsh educational realities: it must prove itself acceptable on the grounds that it can teach basic skills; be infused into traditional subjects rather than demanding a separate course; and use content from conventional subjects in an interdisciplinary way.

Finally as crowded as the curriculum is, teachers need to be encouraged to make room for this "basic" because the future is not just new—it's *now*.

"He's going to stay in there till he learns what discipline is!"

THE FUTURE OF THE FUTURE



"When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong," declares Arthur C. Clarke.

Scores of techniques have been developed to turn the imagination and expertise of people into forecasts of the future. These methods are some of the most widely used:

Intuitive forecasting combines expert knowledge with imagination and insight.

- In BRAINSTORMING, participants are asked, in a group session, to "invent the future"—forecast developments in a specific field, such as health or food resources—and all individuals allow themselves to be influenced and stimulated by others in the group.
- In the DELPHI technique, written questions are sent to specialists, and the responses are tabulated. From the results, further questions are prepared and distributed. Eventually majority and minority opinions are obtained, and these represent an informed judgment on probable, possible, or desirable future developments.

Exploratory forecasting uses existing knowledge and trends to examine probable future developments. Extrapolating from recent or expected innovations, researchers can identify trends and suggest which should be reinforced and which should be curbed.

- With a technique called STUDY CURVES, past assumptions about future developments are compared with what actually took place, and conclusions are drawn as to possible sources of error and margins of uncertainty.
- CONTEXTUAL MAPPING takes into account the mutual interaction of various extrapolated trends. The technique is considered promising because it shows the interdependence of technological and scientific evolution and develops by experience new ways of thought that subsequently include social, political, and psychological factors.
- The MORPHOLOGICAL METHOD consists in stating the problem precisely, exposing its important parameters, determining the number and kinds of solutions, and finally evaluating and choosing the preferred solution. Typical forecasts based on this method have been the increase of world population, pollution of the atmosphere, and growth of nuclear stockpiles. Such studies should serve as "early-warning" systems, allowing the countering of dangerous trends and the accelerating of positive ones.

Normative forecasting takes advantage of a human behavioral tendency to respond to any forecast by either promoting or preventing its realization. An example of such forecasting is the U.S. lunar landing: years before a successful flight was technologically possible, the project was begun and its execution forecast for a specific date.

- The RELEVANCE TREE technique begins with a fixed objective—the top of the tree—and works downward, examining alternative approaches to the goal. This approach highlights what decisions should be made and when, and it has proved useful in the evolution of biology and medicine.
- Using SIMULATION techniques, researchers attempt to envisage possible conflicts and possible future developments that may have been overlooked.

"Nothing new about Team Games. We've always had 'em."

Reprinted from *The New North*, Spring 1982.

Glossary of Terms

Alternative Futures: Possible forthcoming developments. The term emphasizes that the future is not fixed; many things may occur and people should explore the various possibilities and then seek to realize those that seem most desirable.

Delphi Technique (or Method): A method of soliciting and aggregating individual opinions or judgments, typically of a group of experts, to arrive at consensus views concerning such things as what may happen in the future.

Ecosphere: The natural environment in which man lives. The term emphasizes the ecological aspect of the environment.

Extrapolation: Extending a curve into the future simply by assuming that the variable will continue to change at the same rate and in the same direction.

Future Shock: The disorientation that occurs due to rapid social change. The term was coined by Alvin Toffler, author of *Future Shock* (1970), who likened this disorientation to culture shock, a term used in anthropology to denote the disorientation that a person from one culture feels when he lives among people who have a different culture.

Futuristics: The field of study that deals with possible future developments.

Futurology: The study of the future. The term appears to have been first used by Ossip Flechtheim, a German-born professor of political science, when he was in the United States during World War II.

Gaming: The use of a game that simulates a real situation.

Normative: Based on what will be needed. A normative forecaster tries to determine what will be required to achieve goals.

Post Industrial Society: The most widely used of many titles for a new societal phase that has emerged or is emerging. There are two diametrically opposed usages: (1) indicating a service society or an information society, emerging from a successful industrial era, where the majority of the labor force is in occupations other than agriculture and manufacturing; or (2) indicating a more decentralized society of frugal and ecologically-conscious lifestyles, emerging in the wake of an unsustainable industrialism.

Scenario: A description of a sequence of events that might possibly occur in the future.

Simulation: The use of mathematical formulae to replicate or "model" real world processes or behavior.

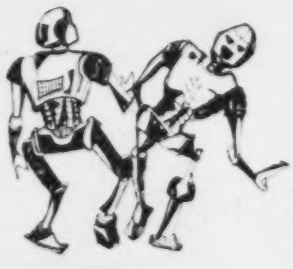
Synergy: The combined action of a number of parts so that the result is greater than the sum total of the separate action of the parts.

Technology Assessment: The evaluation of a technology in terms of its long-range as well as its immediate impacts.

World System Model: A model or simulation that attempts to show the interactions of important global variables, such as population, pollution, economic growth, natural resources, etc.

Goals for FUTURE STUDIES Instruction

1. To stimulate in students the ability to imagine and consider the implications of many alternative possible futures.
2. To enable students to recognize the impact of technology on society.
3. To help students to realize that the future depends to a great extent on what is happening in the present.
4. To help students to realize how anticipated future changes may alter their own personal lifestyles and aspirations.
5. To help students search for and identify future trends.
6. To strengthen students' practical ability to anticipate and adapt to change.
7. To help students develop the attitude that they can be actively involved in influencing their own future.
8. To help students to clarify and evaluate their own values and goals.
9. To help students to clarify and evaluate society's values and goals.
10. To help students understand the requirements for human survival.
11. To help students develop an understanding of mankind as a single human community.
12. To develop in students the ability to integrate ideas and information originating in diverse disciplines.
13. To encourage students to commit themselves to action to improve present conditions in the world.
14. To enable and motivate students to share their futures studies knowledge and insights with others.
15. To help students develop human relations skills.
16. To help students develop an understanding of the world as a single global system.
17. To help students develop an optimistic attitude toward the future.
18. To give students an understanding of some of the basic concepts and methods employed by practicing futurists.
19. To help students appreciate the historic development and importance of human thought about the future.



by Allen Schmieder

For nearly half a century, each time we entered a new decade many educational leaders boldly predicted that the real age of educational technology had finally arrived and that it would cause immediate and dramatic changes in the way we educate children.

Just as regularly, the ever-present doomsayers warned that the machines were going to take over and their mad creators would find new ways to spindle and mutilate us and our precious educational process—to say nothing of our innocent children. And there were always the cautious ones who gave comfort by assuring that these new mechanical wonders were meant only to be our servants and that they would not—as in the ingenious Capek play, *R.U.R.*—replace us. Each time they dragged out the good old dependable simplitude that machines can never be better than those who program them and become their keepers and husbanders. And so "technical know-how," the one element in our progressive civilization that seemed to get better and better in every way and which helped to make a better and better life for almost everyone, became one of the most sure-fire, predictable non-trends, in American education. Donald Bigelow, a wise veteran of the Federal educational civil service, best summed up the nonimportance of this highly important potential power, when he once lamented, "If we could only make the damn microphones work and find a long enough plug to make a connection for our overhanging projectors (let alone diminish the 'keystone effect'), we would be making real progress."

But risking the possibility that educators have become so hardened by the regularly recurring cries about the technological wolf that they will be unable to now respond with the necessary passion and preparedness, many of us in the Teachers' Center Program firmly believe that American education is finally on the threshold of the decade of technology, and because of it, schooling will change more dramatically in the 1980s than it has in the previous century. It is not so much that computers and other gadgets have become so interesting and seductive as to take over or that our students now know them even better than we do, but that we have entered an era of societal and educational revolution that demands that we find better ways to access and process information.

Change is accelerating at an accelerating rate. The classroom is already an estimated two knowledge generations behind the cutting edge of science—and the gap is daily widening. In some technological fields, the body of knowledge and practice can change entirely in as few as three years. Ironically, I.B.M., which has been one of the major pioneers in the new technology, is now faced with the same problems that face us. At a recent meeting with some of the company's top staff developers it was reported that a decade ago their average "product life" was close to 10 years and they had 10-14 months to prepare their personnel to market and service the products. Today, the viable life-span of many products is less than a year and the inservice training programmers have a week to 10 days to accomplish what used to take over a year. The eminent authors of *Teachers for the Real World* which was published 15 years ago, argued strongly for closer cooperation between training programs in business and industry and those in public education. Maybe the time has finally arrived when their rationale and sound recommendations should become reality.

One of the most visible reflections of this accelerating change is the growing list of new subjects and approaches that society and its governing agencies are asking schools to deal with, e.g., special education for the handicapped, the new vocational education, education for the gifted, career education, consumer education, bilingual education, energy education, nutrition education, metric education, environmental education, multicultural education, biomedical education, global education, the new old math, the new basic skills, and over the next 10 years, at least 100 more fields that will be of "absolutely critical importance to all Americans." Many educational leaders dismiss these new thrusts as "bandwagons." They are badly mistaken. These new programs are for the most part true reflections of our rapidly changing world and each represents a serious educational challenge. Whether or not they are more a reflection of this accelerating revolution or of rising social expectations does not matter. They are of great importance to a large number of people and we have yet to establish an ongoing inservice educational system that can rapidly and effectively provide the kind of staff development that will be needed to insure their effective implementation.

Allen Schmieder is the former director of the Teachers' Center Division, U.S. Department of Education.
Reprinted from the Fifth General Session, National Teachers' Center Conference, February 12, 1982.

It will not be enough, however, just to establish an inservice education program that will provide "continuous retraining for all educational personnel." It will have to be the most modern, effective, technologically au courant kind of staff development ever devised by persons. It is essential that we finally take full advantage of the awesome technological capacity that this nation has developed over the last several decades. It seems unthinkable that any educators still believe that we can "keep up" without it, or that without it, we can realistically reflect the kind of new world we are preparing our children to lead.

Two personal examples will show how technology can make a substantial difference in this time of human and educational googolplexity. As a geography professor in the 1960s, I used 15,000 33mm slides to strengthen my teaching about the world. As I am sure you can imagine, the storing, cataloging, maintaining, effective mixing and utilizing of 150 carousels of delicate film and cardboard was quite a challenge. Every classroom hour of brilliant slide shows required 5-10 hours of outside preparation. With the new technology it is now possible for a teacher to place seven times as many slides as I have in my large closet on a single video disc—one that can be held in the hand. Even more amazing, using this disc it is possible in a matter of minutes to array the separate entries into a desirable order—and an almost infinite number of combinations is possible. Example two: In preparing the foundation for a book about the Great Lakes, I spent five years analyzing data from 16 decennial censuses. Today, with the help of computers, geographers are able in the course of a few weeks analyze the same data in ways that are thousand times more complex than in my original six-year study.

It is not just a matter of using technology to help keep up with rapid change. It is also necessary for teachers and their students to know how changing technology has caused us to substantially reform the way we think about the universe. If there were sufficient space in this short treatise, I would elaborate at great length on this subject. It has been generally ignored by educational leaders for 20 years and, as a result, there are many serious consequences that have yet to be discovered and confronted. The serious scholars—the so-called creators of the new knowledge—in most academic and scientific fields have been relying heavily on computers for more than a decade now. Because of that, the major disciplines in the university have become quite different from their curriculum counterparts in the schools that have, for the most part, yet to be impacted by this new emphasis. When you have machines that give access to what the "whole world" knows about a particular subject—machines that can help to organize and analyze millions of units of information, you begin to think about your field of knowledge in far different ways than in the past.

It is probably a less important issue than those already covered, but it should be pointed out that although the majority of jobs that school graduates will eventually compete for are computer-related, most schools give very little attention to computers in their curricula. (It should be pointed out that some school systems are doing a remarkable job in this area.) Any significant increase in the use of computers in the staff development of educators should, of course, help to increase their relative importance in the curriculum.

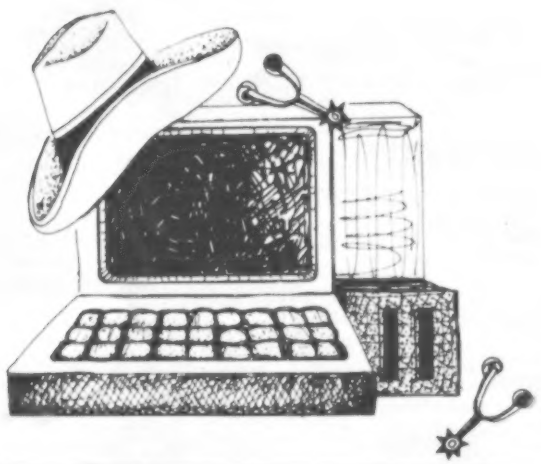
And now to the inevitability of it all. Caleb Gattegna, the great teacher from Spain who now works his wonders in this country, has spent a lifetime trying to figure out why kids love games so much but find schooling to be quite dull. He is convinced that we cannot only learn a whole lot about learning by watching children at play but that it is possible to design educational programs that will excite children as much as their play. I think that the children themselves and the new *R.U.R.*—like games that are pervading every aspect of our lives have joined in a conspiracy to make the conversion, whether we want it to happen or not. And what a wonderful condition! In the last several years, mechanized games for children have become as much a part of modern society as the magic of the Beatles. They have become the principal gifts for special occasions and game rooms are now major meeting places for youth in shopping centers, motels, and other public buildings. And their substance has escalated from colorful ways to simulate sporting events to playing at beating the stock market, reorganizing the Federal government, or redistributing the world resources. The young people not only love the intellectual challenges offered by their technical playmates but have become most comfortable with the knobs, the scratched screens, the rapidly moving images, and the funny sounds. It was curious to notice at an educational conference on energy that I attended, that the 8 or 10 different computerized educational programs on energy that were available for use by all the participants were swarmed over by the kids, whereas most of the adults in attendance stood in small groups, their coffee in hand, and exchanged wise views on matters much less closely related to the subject of the conference.

"The hearts of their human inventors were lifted—looking out the window, they noticed that the two young robots who were passing by were lovingly holding hands."

While the antelope will continue to outnumber programmers for some time, there is a growing movement in Wyoming to incorporate computer literacy programs in the public schools.

COWBOYS AND COMPUTERS

by John C. Russell



The East Coast has its New England computing establishment, the West Coast has its Silicon Valley, and in between plenty of other technological types are doing their thing to further the computer's effect on our daily lives.

But then, there are some places that couldn't possibly have any stake in the computer revolution. Like wild old Wyoming, for example. Everybody knows that cowboys and computers have nothing in common.

Bad assumption! While it is true you won't find major computer manufacturing plants sharing the horizon with oil rigs, and the antelope will no doubt continue to outnumber programmers for some time, there is a growing movement in Wyoming to incorporate computer literacy programs in the public schools.

The focal point of these efforts is the Science and Mathematics Teaching Center (SMTC) of the University of Wyoming in Laramie. Affiliated with both the College of Education and the College of Arts and Sciences, SMTC is a flexible arm that reaches effectively to the far-flung districts of the state, providing guidance and support to science and mathematics teachers. Recently, it has jumped enthusiastically into the microcomputer education arena, and from here on out it promises that Wyoming will grow with the new technology.

The main man in SMTC's computer goings-on is Dr. Bob Kansky, a dynamic individual who is also well-known through his work with the National Council of Teachers of Mathematics. One of Kansky's most recent projects was to coauthor *Guidelines for Evaluating Computerized Instructional Materials*, a document that takes one step toward committing the National Council to computers in the classroom.

Around the state some pockets of computer interest have existed for a number of years. In Rock Springs, teacher Bob Hilgenfeld has been a leading computer advocate, conducting University-approved courses in computing for teachers in Wyoming and Utah. Further, his junior high classes produce research projects with the aid of The Source electronic information utility, an activity that may be unique in the nation.

Dave Hamaker, a high school math/science teacher, and Don Larsen, a teacher of special education, both of Lusk, like to talk of adapting the Apple for small-school administrative tasks. Their students actually do the school's class registration, and assist local businesses in creating mailing lists and writing stockholder reports.

Walt Miner, a Cheyenne English teacher, is a reminder that computers are not the private playthings of scientists. He is working with a Title IV-C grant to develop highly specific programs to correct highly specific student writing errors, and is using a word processor to help students with creative composition.

Plans are in the works for a statewide, student-run microcomputer network which not only will encourage the exchange of ideas among schools, but eventually may serve some needs of administrators and the State Department of Education.

Last summer, a great number of teachers from across Wyoming, Colorado, Nebraska and Montana descended on the University campus to take advan-

John C. Russell is with the Science and Mathematics Teaching Center, The University of Wyoming, Laramie.
Reprinted with permission of 80 *Microcomputing*, copyright 1982.

The school establishment must bear a responsibility for helping to protect the product, and hence the livelihood, of the talented designers and programmers.

tage of a variety of computer-related courses. Besides the usual Basic programming course, there was a software evaluation seminar which reviewed a large amount of commercial material lent by many vendors, a course in the variety of applications of computers in the school and a two-week course in computer literacy for teachers.

A National Science Foundation grant brought together 40 teachers from 20 Wyoming districts to learn the intricacies of the Apple II. SMTC will then deliver Apple systems and support personnel to the participating districts for several weeks at a time during this academic year. The point of this project is to sow the seeds of interest in teachers with little experience in computing.

An important concern for the staff of SMTC, as it is with many others nationwide, is the misrepresentation of the potential for computers in education. Drill-and-practice programs are some of the easiest to write, and so many of the earliest efforts by the commercial houses have been along those lines. Smiling or scowling faces have decorated computer screens from the Atlantic to the Pacific, accompanied by the tedious "Super!" or "Try again." Skeptics can point to the computer and accuse it of being nothing more than a set of electronic flash cards.

There is great need for sophisticated, valid simulations, for demonstrations with interactive capabilities, for meaningful problem-solving vehicles and for a number of packages dealing with other applications.

While knowledgeable teachers are beginning to make these desires clear, there lives at the same time the issue of software copyright and software piracy. The school establishment must bear a responsibility for helping to protect the product, and hence the livelihood, of the talented designers and programmers.

SMTC has addressed this point of controversy publicly and knows of no other similar institution to have done so. It has authorized and published the following declaration:

"The Science and Mathematics Teaching Center of the University of Wyoming will not participate in the unauthorized reproduction or exchange of any computerized course-ware which bears an explicit or implicit copyright."

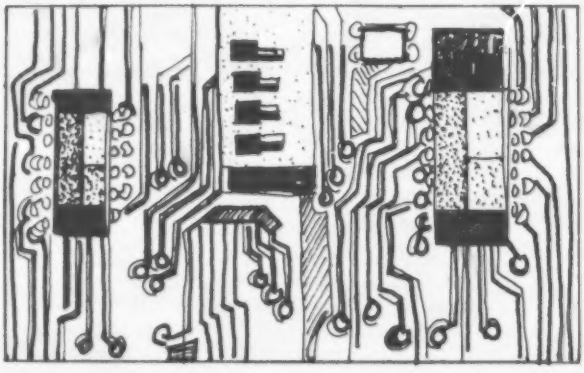
In further discussion, such unauthorized activity is deemed to be "larceny."

SMTC looks forward to the day when other responsible voices will echo this stand, and in the meantime savors the excitement that computers have brought to the schools of the mountains and high plains.

"I guess the Teachers' Exchange got a little out of hand."

CAN WE COPE WITH WYOMING'S NEWEST IMPACT—COMPUTER TECHNOLOGY?

by R. M. Hilgenfeld



New Matrix

Over the past few years Wyoming has experienced many changes due to impact. A uniquely Wyoming life style has undergone a complex infusion of mores, attitudes, and values compounded by a general acceleration in the pace of things.

Our newest impact is not people or industries, but information. We have crossed the threshold into the computer age where data collection is both a highly technical skill and a very marketable commodity. Computers have not just touched us through bank records, credit cards, governmental forms, school and college registration, but have begun more and more to manage our lives. As a culture, we are all too familiar with that frustrating phenomenon—the "computer error." As we've learned, sorting out the correct data from the incorrect is the easy part; getting the computer to acknowledge the change is something else again.

Since it's unavoidable, what's the best way to deal with the computer age? As individuals, we certainly need to understand how the process works. But since computer knowledge relates directly to control over our destinies, we must take responsibility for coping with this trend.

As educators, we have a further obligation—to prepare our children for a technological future. Society's already heavy dependence on computers predicts an even greater impact on them tomorrow.

Expanded Function

To ready our students for this new age of information we must point out, every time the situation presents itself, the capabilities of computers. They need to know, for example, that many experts believe computer-related jobs may reach 50 to 60 percent of the job market in the 1990s. That doesn't mean that we are trying to turn out armies of computer programmers. It does mean that to function in society our students will need a new tool along the old reliables of "readin', writin', and 'rithmetic." That new basic skill is "computer literacy." No longer can we perpetuate the old myths and inaccuracies about computers—we must overcome the fears as well as master the functions of these "thinking machines" if we are to survive.

We also have to deal with some outmoded thinking about the way we currently do things. The day is gone when we can depend on the memorization of timely facts as a basis for an education. Now it is necessary to provide students with basic methods of assimilating, synthesizing, and analyzing information. These are the roots of future problem-processing. These are the areas in which young minds must be trained.

Interesting Note from *ETC: Educational Technology and Communication* Far West Laboratory for Educational Research and Development.

In 1980, the school districts across the country purchased a total of $35 million worth of microcomputers and microcomputer-related equipment. That amount, experts forecast, will continue to increase annually, and by 1985 school purchases will reach $145 million. Schools are making a commitment to high technology, and some more strongly and more quickly than others, but most are making it nevertheless.

R. M. Hilgenfeld is a former junior high school math teacher now pursuing graduate studies in computer technology at the University of Wyoming. He has also been honored as a Wyoming Teacher of the Year.

Simultaneous Capability

We need to go one step further. We must communicate to our students the limitations of technology. There are many functions the computer will not perform and we need to be specific in showing them how the emotional and creative capabilities of the human mind set it apart from the computer. More and more as the quality of technological devices improves, we will need to emphasize those differences. By freeing the mind for more creative activity while letting the computer quickly and accurately do the tiresome computation and organization of data, we can merge the best of both systems to solve tomorrow's problems.

Power-On Self-Testing

A cautionary note: inherent within any system—especially a new one—are possibilities for abuse. The right to use a computer carries with it a responsibility not to misuse the system or the information it contains. Computer access does not excuse computer license: therein lies the problem of preserving the integrity of the system's security and protecting the individual's right of privacy. This also must be part of our computer instruction.

On-Line

Clearly, our students will need more than a passing acquaintance with the computer. Future generations will not only need to be knowledgeable about its capabilities and limitations, but capable of sitting at a computer keyboard and executing a computer program; familiar with information storage and retrieval; aware of the restrictions placed on the microcomputer (the personal or desk top variety); and informed about associated uses in the office, school, and home. That computers, talking to each other across town and across the world eventually rendering our present postal system unrecognizable, is one more indication that computers need to be a necessary component of our children's education.

New Program

No segment of the society will likely suffer a greater impact from computer technology that educational institutions, including higher education. Computers are already permeating every level of the system, from graduate to grade school. They are being used in the elementaries with increasing frequency and excitement by young minds discovering the entirely different world of the computer. For the first time in the history of education, there is a device capable of disseminating information and interacting with the user at the same time. Computers are tireless teachers of infinite patience. They allow users to learn at individual speeds. They help students work in unfamiliar areas while managing, directing, and monitoring courses of study. Contrary to many fears, they will not replace teachers or revolutionize teaching. What they will do is revolutionize learning by providing teachers with information on student progress and help in the planning process.

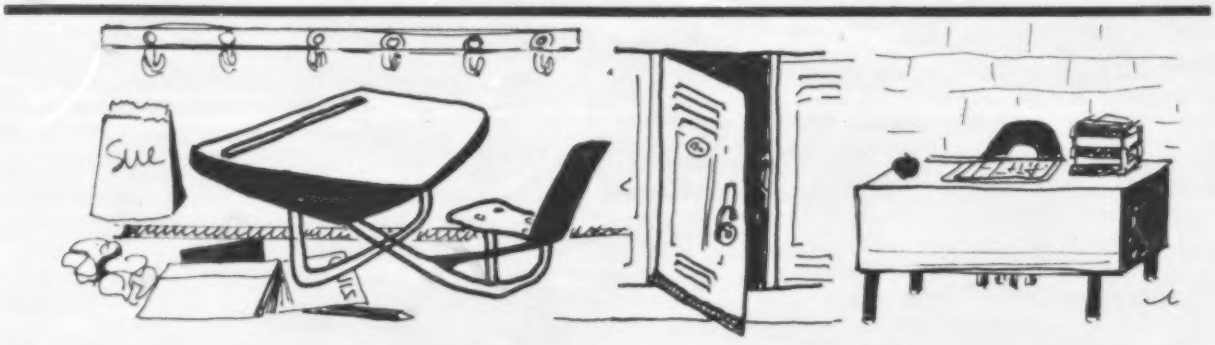
Internal Drive

Wyoming's leadership in many areas of our society, including women's right to vote, has shown its ability to tackle and solve problems of a magnitude much larger than itself. We in Wyoming need to take a leadership role in the development of meaningful, innovative educational programs that will prepare our young people for life in the computer age.

Teaching our students to cope with change includes teaching ourselves to cope with it—to temper advancement with self-discipline and restraint while selecting the solid "bits" to build a society dependent on, but comfortable with, computer technology.

"He heard we were doing a Wealth Assessment."

CLASSROOM SAVVY



by Jere E. Brophy

Teachers, principals, and teacher educators have long recognized classroom management skills as essential to teaching success and have stressed these skills in rating teachers. In addition, reviews of recent research on teaching have concluded that classroom management skills are associated not only with student attention and time-on-task but with student achievement in basic skills. Teachers who organize and manage classrooms effectively create a good learning environment.

Yet, even though effective classroom management is central to effective teaching, few teacher education programs systematically instruct their students in how to manage classrooms effectively. Part of the reason why hinges on the complexity of classroom management. It does not fit cleanly within any one of the traditional education disciplines (curriculum and instruction, foundations, educational psychology, special education, etc.), involving, instead, several of the disciplines.

Thus, classroom management has tended to slip through the cracks of traditionally organized teacher education programs. And until recently there was no scientific knowledge base upon which teacher educators could draw in developing systematic instruction in classroom management. There were two main sources of ideas: practitioners' common sense suggestions and "bag of tricks" tips, and suggestions from learning theorists, psychotherapists, and various social scientists whose ideas might or might not be useful in the classroom.

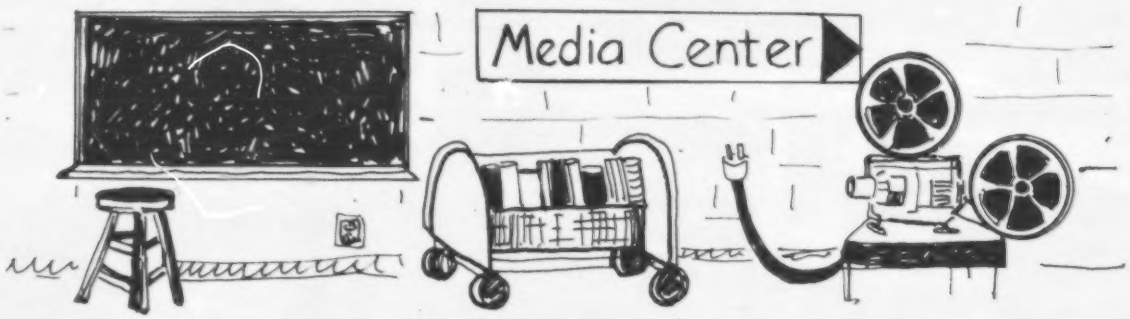
The situation has improved dramatically in the last 10 years, as sources of advice to teachers have converged on a common core of ideas, many of which have been validated in typical classroom settings.

Jere Brophy is Professor of Educational Psychology and Co-Director of the Institute for Research on Training at Michigan State University.
Reprinted from *American Education*, U.S. Department of Education, March 1982.

Preparation, Organization, and Prevention

Too often, "classroom management" is equated with "discipline," "control," or other terms that connote stopping unacceptable behavior by setting and enforcing firm limits. This connotation is unfortunate because research on classroom management regularly indicates the need to stress prevention over remediation. It is important for teachers to know how to deal with student behavior problems when they occur, but the crucial classroom management skills appear to be those involved in planning, organizing, and maintaining a learning environment that engages students in productive activities, thus lessening the need to deal with problems in the first place. Reactive response to student misconduct is but a small part of effective classroom management. The major part involves active teacher planning and decision-making focused on setting up a functional physical environment, matching curriculum and instruction to student needs, and establishing efficient routines for handling everyday housekeeping and logistics.

Wise practitioners have known this all along: Kounin (1970) and his colleagues demonstrated it conclusively in classroom research. They videotaped two types of classrooms. The first type functioned remarkably smoothly, seemingly automatically. Students were attentive to lessons and engaged in seatwork. Transitions between activities were brief and orderly. The teachers, enjoying excellent cooperation from the students, were able to accomplish whatever they needed to do with minimum time and effort. In contrast to these successful classroom managers, the teachers in the comparison classrooms were fighting to keep the lid on. Activities suffered from poor attention and frequent disruption. Transitions were lengthy and often chaotic. Much of the teachers' time was spent dealing with student misconduct.



Kounin and his colleagues analyzed the videotapes from these classrooms in detail, concentrating on teachers' methods of dealing with student misconduct and disruptive behavior. Given the striking contrast in classroom management displayed by the two groups of teachers, the researchers expected to see large and systematic differences in methods of dealing with student misconduct. To their surprise, they found no systematic differences at all! Good classroom managers were not notably different from poor classroom managers *when responding to student misconduct.*

Fortunately, the researchers did not stop at this point. In the process of discovering that the two groups of teachers did not differ much in their responses to students who have become disruptive, they noted that the teachers did differ in other ways. In particular, the effective classroom managers systematically did things to minimize the frequency with which students became disruptive in the first place. Some of these teacher behaviors are as follows:

"With-it-ness": Effective managers nipped problems before they could escalate into disruption. They monitored the classroom regularly, stationing themselves where they could see all of the students and scanning all parts of the classroom continuously. This and related behavior let students know that their teachers were "with it"—aware of what was happening at all times and likely to detect inappropriate behavior early and accurately.

"Overlapping-ness": Effective managers had learned to do more than one thing at a time when necessary. When conferring with individual pupils, for example, they would continue to monitor events going on in the rest of the classroom. When teaching reading groups, they dealt with students from outside the group who came to ask questions without disrupting the reading groups. In general, they could handle routine housekeeping tasks and meet individual needs without disrupting the ongoing activities of the class as a whole.

Signal Continuity and Momentum in Lessons: Whether teaching the whole class or a small group, effective managers were well prepared and thus able to move through the activity at a brisk pace. There were few interruptions due to failure to bring or prepare a prop, no confusion about what to do next, no need to stop and consult the teacher's manual, no false starts, or no backtracking to present information that should have been presented earlier. Minor, fleeting inattention would be ignored. More serious inattention would be dealt with before it escalated into disruption but in ways that were not themselves disruptive. Thus, these teachers would move near to the inattentive students, use eye contact when possible, direct a question or comment to them, or cue their attention with a brief comment. They would not interrupt the lesson by delivering an extended reprimand or other overreaction.

In general, students tend to be attentive (or their inattention fleeting) when they have a continuous academic "signal" to attend to. Problems tend to set in when they have no clear "signal" to attend to or task to focus on, and such problems tend to multiply in frequency and escalate in intensity the longer the students are left without such a focus.

This study made it clear that the seemingly automatic, smooth functioning observed throughout most of the school year in the classrooms of successful managers resulted from considerable preparation and organization at the beginning of the year. Successful managers spent significant classroom time in the early weeks introducing rules and procedures. Room arrangement, materials storage, and other physical factors had been prepared in advance. On the first day and throughout the first week there was special attention to matters of greatest concern to the students (information about the teacher and

classmates, review of the daily schedule, times and practices for lunch and recess, where to put personal materials, how to use the bathroom, when and where to get a drink). Classroom routines were introduced gradually as needed, without overloading students with too much information at one time.

Implementing classroom rules and procedures was more a matter of instruction than "control," although it was important for teachers to follow through on their stated expectations. Effective managers not only told their students what they expected them to do but personally modeled the correct procedures for them, took time to answer questions and resolve ambiguities, and allowed time for practice of some procedures. In short, key procedures were taught to the students in more or less formal lessons, just as academic content is taught.

Effective managers were thorough in following up on their expectations. They reminded students of key aspects of procedures shortly before they were to carry them out, and they would schedule additional instruction and practice when procedures were not carried out properly. Students were monitored carefully and not "turned loose" without careful direction. Consequences of appropriate and inappropriate behavior were clearer than in less effectively managed classrooms and applied more consistently. Inappropriate behavior was stopped more quickly. In general, the more effective managers showed more of three major clusters of behavior:

Behavior that Conveys Purposefulness: Students were held accountable for completing work on time (after the teachers taught them to pace themselves using the clock). Regular times were scheduled each day to briefly review independent work (so that difficulties could be identified and follow-up assistance offered quickly). Teachers regularly circulated through the room during seatwork, checking on each student's progress. Completed papers were returned to students as soon as possible, with feedback. In general, effective managers showed concern about using the maximum time available for instruction and about seeing that students learned the content.

Teaching Students How to Behave Appropriately: Effective managers were clear about what was expected and what would not be tolerated. In particular, they focused on what students should be doing and, when necessary, on teaching them how to do it. This included not only the "don'ts" involved in keeping order and reasonable quiet in the classroom but also more prescriptive and learning-related behavior such as how to read and follow directions for independent work. Responses to failure to follow these procedures stressed specific corrective feedback rather than criticism or threat of punishment.

Teacher Skills in Diagnosing Students' Focus of Attention: Effective managers were sensitive to student concerns, continually monitoring students for signs of confusion or inattention. They arranged desks so that students could easily face the point in the room where they most often focused attention; used variations in voice, movement, and pacing to refocus attention during lessons; scheduled daily activities to take into consideration changes in students' readiness to attend vs. their needs for physical activity; had clear beginnings and endings to activities and efficient transitions between them; and required active attention of all students when important information was being given.

Even after the early weeks of the school year, effective managers continued to maintain their desired routines. While they spent less time on procedural instruction and practice, they continued to give reminders and remedial instruction when necessary and they remained consistent in enforcing their expectations.

Follow-up work at the junior high school level revealed similar differences between effective and ineffective classroom managers—although it was clear that junior high teachers did not need to put as much emphasis on rules and procedures, particularly how students should follow them. It was especially important, however, for junior high teachers to communicate their expectations clearly and to monitor students for compliance. Procedures for maintaining student responsibility for engaging in and completing work assignments were especially important in junior high school.

Most recently, this research team has followed up their observation research with intervention studies, in which teachers are trained in effective classroom management techniques, using an extremely detailed manual based on their earlier work. These intervention studies showed success in improving teachers' classroom management skills, and consequently, students' task engagement rates. Subsequent to these intervention studies, the training manuals are revised and then made available, at cost, to teachers and teacher educators. The junior high manual is still under revision, but the elementary manual is available (Evertson, Emmer, Clements, Sanford, Worsham, and Williams, 1981).

Dealing with Chronic Problems The research reviewed above has yielded detailed and workable principles for classroom organization and group management. If implemented consistently, these principles can enable teachers to establish smoothly functioning classrooms. But what about students who present chronic, severe problems that require

more intensive or individualized treatment? Researchers at the Institute for Research on Teaching at Michigan State University have been studying this problem by interviewing experienced elementary school teachers working in a variety of settings.

The study focuses on 12 types of chronic student problems that appear frequently in elementary classrooms: low achievement, underachievement, perfectionism, failure syndrome (defeatism and helplessness resulting from repeated failure), hostility and aggression directed against peers, passive-aggressive behaviors directed against the teacher, open defiance of the teacher, hyperactivity, distractibility, immaturity, peer rejection, and social withdrawal.

Participating teachers were nominated by their principals as being either average or outstanding at dealing with these kinds of student problems. They were chosen from among teachers at the school who had had at least three years of experience. These 98 teachers were observed in their classrooms to gain information on their styles and levels of success in dealing with student problems. They were then interviewed in detail about how they handle each of these 12 problem student types and how they would handle each of 24 vignette situations depicting specific incidents that these student types are likely to create in the classroom. Analyses are still in progress, but some information is already available.

In general, the more effective teachers include classroom-socializing students and dealing with their problem behavior (in addition to teaching them curriculum content) as part of their definitions of the teacher's role. They accept the challenges that these students present and try to deal with them personally rather than pass them along to the principal or a mental health counselor (although in extreme cases they will call on these professionals to assist in dealing with the problem).

The strategies favored by these effective teachers emphasize long-term problem-solving over short-term control measures. Specifically, instead of (or at least, in addition to) merely trying to control students through firm demands or threats of punishment, these teachers try to identify and work on the causes of the student's problem behavior, to provide support and counseling help, to use environmental restructuring and behavior modification methods to change inappropriate to effective behavior, or to use instruction or modeling to teach students how to cope with problem situations more effectively.

For example, in dealing with failure-syndrome students who have essentially given up attempts to cope with classroom demands, effective teachers refuse to cave in by reducing task demands and treating these students as if they are really unable to succeed in the classroom. Instead, they approach such students with a mixture of sympathy, encouragement, and demands. These teachers reassure the students that they do have ability and that work given will not be too difficult for them. Then, the teachers help them to get started when they are discouraged or need some support, reinforce their progress, and perhaps offer contracts providing rewards for accomplishments and allowing opportunities for students to set goals. In general, the emphasis is on encouragement and help rather than prodding through threat of punishment. Failure-syndrome students are not merely *told* that they can succeed, but *shown* convincingly that they can, and *helped* to do so.

Similar themes are seen in the approach of effective teachers to underachieving students who prefer to socialize or entertain themselves rather than to do their assigned work. In comparison to failure-syndrome students, these underachievers are acting more deliberately and in control when they choose not to do their work, and thus are more blameworthy for their actions. Effective teachers do hold them responsible for these actions, but they do not confine their response to threatening punishment. They investigate and seek to do something about underlying causes of the problem behavior, and use a variety of approaches designed to improve the students' attitude toward school work: identifying and capitalizing on interests, pointing out logical consequences, developing and using personal relationships, providing remedial instruction where necessary.

When completed, this project will yield information on general strategies that teachers can use for dealing with each of these 12 types of problem students, as well as guidelines for specific responses to the 24 typical problem situations depicted in the vignettes. Because these strategies are being reported by teachers, based on their experiences in typical classrooms, they should be more useful to other teachers than the strategies suggested by psychotherapists and other mental health professionals. The data should also indicate which suggestions from sources like Dreikurs, Glasser, Gordon, and various behavior modifiers seem to be used most frequently and effectively in classrooms, and which are less successful.

A great deal of useful information about classroom management has accumulated in the last 15 years, and it is both more research-based and more internally consistent than before. For the first time, a knowledge base sufficient to support systematic instruction in classroom management is available. This brief article has touched upon only a few highlights.

from the Teacher's Desk

by
Lyn Moran

Dear Mrs. Morgan,

May I please apply to be a third-grader in your classroom? I am very good. I have been able to complete all my daughter's homework to date. I can count to 50 by two's, I can do the puzzle in the Wee Weekly Workbook, and I almost never color outside the lines. My knowledge of music includes the "Star-Spangled Banner" and "Eensy Weensy Spider Went Up the Water Spout."

You may think this request is—well—different, but please accept me in your class. When I observed your room at Parents' Back-to-School Night and you showed us how much fun everybody has, I knew I belonged there. All those games and books—and movies on Fridays. And recess! Wow! Time to go do whatever I want! No demands! No pressures! No floor-mopping. (There are a lot of days when I want to swing from the chandeliers—so the monkey bars looked like my thing!)

I wouldn't complain about the lunchroom. To get a hot meal for 85¢ that somebody else has planned, prepared, and cleaned up—bring on that chili dog!

You may wonder what my real motives are. Am I a C.I.A. agent secretly searching for leaks in lunch boxes? Am I trying to sell used "Hot Wheels" at a discount? Do I have my own "Twinkie" concession? No, I'm doing it entirely for you . . .

Wouldn't you like a neat, orderly child with clean nose and dry pants who always follows directions, never gossips with her desk "neighbor," and doesn't do "cut-sies" in line? Wouldn't you like someone who is tall enough to help change bulletin boards, old enough to get to the bathroom on time, and smart enough not to lose her "froggy" eraser? I can even write cursive.

What is more, you'd be doing for me what you promise to do for all second-graders—build a new self-image! Success spawning success! Never to be nagged again! Never to hear: "Why can't you?" "Oh, yeah!" and "Mommy, you is stupid!" Instead, you'd give me "positive reinforcement": gold stars, "Good Jobs," "Smiley Faces," and "100%'s." Maybe I'd even get cupcakes in class on my birthday.

"When are you going to . . . ?" "Why did you?" "Why didn't you?"

Can I come? Say the word and I'll sharpen my pencils and tidy my schoolbox. (I even do walls and windows.)

Sincerely,

ME

DOES IT REALLY MATTER?

by Bill Nelson

If the plants in your room are growing, but you aren't!

If your bulletin boards sparkle, but you don't!

If your room is inviting, but you're not!

If you remember to take attendance, but forget to smile!

If your room is quiet, but no one listens!

If you teach the 3 Rs, but don't Relate!

If you encourage creativity, but discourage day-dreaming!

If you teach Democracy, but don't allow choice!

If you teach values, but pass judgment!

If your kids behave, but seldom laugh!

If your kids remember the capital of Iowa, but forget who taught them!

If your kids have the right answers, but don't question!

If your kids know the 3 Rs, but aren't Responsible!

If it matters, there's TIME!

Bill Nelson is a supervisor of student teaching at Western Illinois University in Macomb, Illinois.

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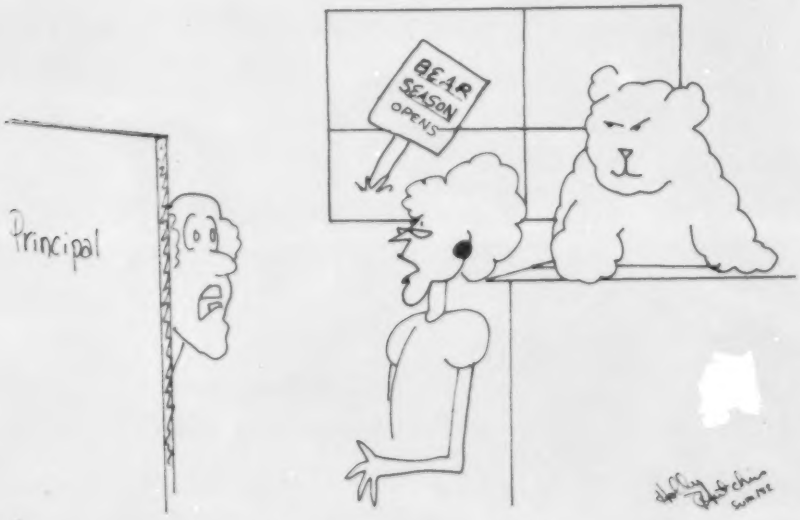

"He says he wants the filmstrip on Stress."

WHAT DO YOU DO WHEN . . . ?

A Guide for Classroom Discipline Problems with Practical and Positive Solutions

by
Robert L. Gervais
and
Delos A. Dittburner

If you've ever wanted a list of tried-and-true classroom management ideas all in one place, let us introduce you to the work of Robert Gervais of the University of Wyoming, and Delos Dittburner, principal of East Junior High, Casper. Dr. Gervais teamed up his experience as a classroom teacher, associate professor and supervisor of student teachers with Mr. Dittburner's background as a teacher and principal to compile a detailed set of solutions to 61 common class management problems. In the three years they took to gather and analyze this informal data from weekly meetings with other teachers and administrators, they managed to look at everything from cheating to checking the john, cliques to confrontations, coping with parents to coping with class size. These excerpts from their book will give you a flavor of their "practical and positive" solutions.

Are You Gonna Call My Mom?
— Phone Calls Home —

One of the most effective classroom management techniques is obtaining parental cooperation and support. Experience shows that most classroom problems can be diminished or eliminated when parents and teachers work together. However, far too many teachers exhibit a reluctance to call or contact parents. Why?

Calls from school traditionally carry a negative connotation and no one enjoys delivering bad news. Also, some teachers still adhere to the fallacy that they must handle all problems without assistance or be considered incompetent.

Consider calling parents early in the school year before serious problems develop. This initial contact will establish a working relationship which will be

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helpful in solving future problems. Be positive. Keep in mind that many parents feel uncomfortable talking to teachers for a variety of reasons. Do not misconstrue parental anxiety or aloofness as a lack of willingness to cooperate.

When you call parents, pay careful attention to the following items:

1. Check names—parents and students may not have the same last name. Mrs. Clark does not want to be called Mrs. Jones and have to explain.
2. Identify yourself—"This is Miss X from school—I'm Johnny's teacher."
3. State there is no emergency. Ask if it is convenient to talk now. This is doubly important if you're calling the parent at work.
4. Never call when you are angry or upset.
5. Never push the conversation.
6. Be concerned--tell the parent, "I'm concerned about Johnny because . . ."

Remember how important each student is to the parent and that part of American folklore is that a good education is important for success. We honestly feel that if you call parents as a concerned person you'll get their help and support.

Summary of Solutions

1. Set a goal of calling two parents each week to report positive accomplishments.
2. Keep up your professional obligation to keep parents informed—especially when it concerns poor progress academically or behaviorially.
3. Never forget that communication with parents is a valuable tool in maintaining good classroom management.

* * * * *

"Let's Talk About It"
— Parent Conference —

Parent conferences are in many ways similar to telephone calls. However, they differ in many respects due to the physical proximity involved. Phone conferences are generally easier to conduct, but people sometimes become more belligerent on the telephone. Personal conferences may have a mellowing effect on both parties, but they can also reflect more serious problems.

Other than regularly scheduled school-wide parent-teacher conferences, the most common reasons for conferences are grades and discipline. Occasionally, a third party, such as an administrator, counselor, or social worker, will call them.

In any case, where should you meet? Many conferences end up being held in the school office, hall or in front of a class. It's much better to conduct them in private, in an empty office or classroom, especially one that is comfortable and attractive. It's critical that you properly prepare for *each* conference. Know what you're doing, get your data together and preview your goals for the conference. Being confident means being prepared.

Enter your conferences with a positive attitude. Never do anything to make a parent feel threatened. Don't be defensive. Don't downgrade the student and family. Above all, make sure the parent understands your genuine concern for his/her child.

It's important to be specific: don't talk in generalizations. Show the parent the student's work and your record of discipline incidents. Give parents suggestions on how to help their child and ask for their suggestions in return.

Keep in mind during conferences that parents are forming an opinion of you and the entire school: this may be the only source of information parents have other than their child. The way you conduct the conference, your personal appearance, attitude, and knowledge will determine whether you have gained a supporter or an enemy. Your career as a teacher will be much easier if you manage to get cooperation rather than confrontation from parents.

Summary of Solutions

1. Remember that face-to-face conferences are more positive than telephone conversations. People are more reasonable.
2. Get information about parents' names and work schedules before calling or setting up conferences.
3. Check records of grades, ability and general information in cumulative folders beforehand.
4. Inform the student also that you plan to have a conference. At the end, summarize what was agreed to by each party.
5. Invite a principal to sit in on a conference that may be negative—e.g., when the parent is angry or upset with you and the school.
6. Begin and end the conference on a cordial note. Thank the parents for coming.
7. Understand that the majority of parents want to be cooperative.
8. In a reassuring, confident way, express a desire to help the student.
9. Try to see the parent's viewpoint as well as yours and the school's.

10. Ask parents for their help. Get them on your side.
11. Don't be defensive. Listen.
12. Give parents a chance to suggest solutions.
13. Find something good to say—avoid making only negative comments.
14. Recognize that parents who expect too much from their child are difficult to deal with effectively.
15. If parents have a defeated attitude, support them to begin helping their student.
16. Send a progress report home as a follow-up to the conference in two or three weeks.

* * * * *

Making the Grade

— Grading Procedure —

If you're wondering why a discussion of grading procedures is included in a work on classroom management, consider this definition: classroom management is anything that can promote control or prevent disruption of the educational process.

Consider a case in point: incidents that can typically follow the distribution of report cards:

1. Certain parents call the principal demanding to know why their child received certain grades.
2. Several students react in shocked, angry ways.
3. Some students and parents demand a change in teachers.
4. Particular students categorize their teachers as "easy" or "hard" in terms of grades.
5. Angry parents demand conferences to explain grades.
6. Many students interpret their grade as indicators of being liked or disliked.

The time and effort to resolve these problems not only reduces your energies for productive classroom planning and work, but can result in alienation among teachers, parents, and students leading to additional management problems.

These things happen all too often because students and parents don't understand grading procedures. Some students still feel that teachers "give" them a grade—it is not earned—or they may believe grades are based upon some personal whim of teachers. The bottom line is that when a grading system is deemed "mysterious" it will soon be called unfair. Students must understand the reward system (grades), if you expect them to be motivated and work hard. Most grading problems occur because of the extreme variance and inconsistency in procedures. Not only does grading vary from district to district and school to school, but within the same building. Further compounding this are teachers at the same grade level and/or subject who use totally different methods to arrive at a grade creating, in effect, two different classes out of the same class.

We conducted a classroom management seminar on grading, and gave teachers from several grade levels and subjects four identical examples of student work. The student work consisted of two quizzes, a term paper, and a final test. Correct answers were supplied. Teachers were asked to assign a letter grade to each paper and then compute a term grade based upon the four papers. Results on individual papers varied from "F" to "A" and the term grades from "D" to "A." The only variable was the teacher. Obviously, methods and standards used to compute the grades were not equal.

Whatever else, an effective grading system should be:

1. easily understood by parents, students, and other educators
2. simple to compute
3. open and non-secretive
4. objective rather than subjective
5. consistent
6. based on numerous assignments, quizzes, or tests.

A highly successful method that meets those requirements is the "point system." It assigns a variable number of points to different items such as homework, quizzes, major tests and projects.

A percentage is easily calculated by comparing the total possible points to the pupil's earned points. This type of grading system is much like computing a "batting average" and is relatively easy for students (in fact you should require them) to keep a record of their grades and progressive averages. This method also allows teachers to easily communicate with parents when explaining grades.

You may also enhance communications with parents by going beyond the traditional report card that only lists a letter grade. You might consider an additional or supplementary report showing a student's total points, percent, and rank in class. Encourage students to take the report home and discuss it with their parents. An incentive of a few extra credit points may help achieve this goal.

Your grading procedures should also include methods of keeping parents informed between reporting periods. Do not hesitate to call parents, have conferences, send home progress reports or "happy grams." Parents do not like to be surprised when report cards are issued, especially if it's bad news.

Summary of Solutions

1. Make sure students thoroughly understand your grading system.
2. Be comfortable with your grading method.
3. Do not be secretive or mysterious.
4. Allow students to come in after school to see and discuss their grades.
5. Go over grades with students before report cards are issued.
6. Use objective criteria whenever possible.
7. Keep your grading system simple.
8. Do not allow discipline to affect academic grades.

* * * * *

Homework? What Homework?
— Homework Problems —

There are generally two ways homework can cause problems for classroom teachers. The least obvious is when all students do their homework on a regular basis and you become inundated with papers. You need to be careful not to assign too much homework and create situations where you simply don't have time to adequately correct assignments. Often, this time could be better spent preparing lessons or working individually with students.

However, the other major problem is not so easily controlled. Sometimes students simply do not complete assignments. This can be a form of defiance leading to more serious discipline problems. You obviously want to avoid this. Let's examine some reasons students fail to do homework.

In many cases the reason may be similar to the teacher's problem above, that is, youngsters simply do not have time to do the assignments for all teachers. It's easy to forget that your students may have several other classes, all of which may assign homework.

To maintain student interest ask yourself:

Do you consider differing abilities and interests of students when assigning homework? Do students understand the reason for doing the work? Are you enthusiastic about the homework you give? Or, do you cop out by blaming the students—stating that they get lazier every year?

Is your homework "busy work"? Are assignments learning experiences that reinforce classroom lessons? Or, are they boring repetitions of skills and concepts already taught?

Do you correct and return assignments in a reasonable amount of time? Is quality and quantity of student work directly related to your method of reward and reinforcement? Or, are students reflecting the same attitude toward homework that you have—drudgery?

How do you go about giving a homework assignment? Do you have an established procedure? Are assignments thoroughly understood by all students with both oral and written directions and adequate time for questions and working examples? Or, do you shout out tomorrow's assignment as the bell is ringing and students are dashing out the door?

Let's examine a couple of ways to handle homework that won't take all evening to correct. First, remember that most people learn a little at a time. Therefore, teach a little at a time.

If you'd rather not collect or correct homework, give an assignment such as "Learn the information on pages 26-27." Next day give a quiz. This could increase student attentiveness, cut down discipline problems, motivate students to pay attention and make life more pleasant for everybody.

When you find that some students aren't doing what you expect, after you've tried every method you know, don't blame them or yourself. Remember, students are people. Some teachers are satisfied with being mediocre and some students are satisfied with a "C" or less.

Summary of Solutions

1. Make relevant, meaningful assignments.
2. Give students sufficient time to properly complete assignments.
3. Keep in mind that your students have other classes.
4. Explain why certain assignments are necessary.
5. Correct and return homework promptly.
6. Motivate students with your own positive attitude about homework.
7. Include oral and written directions with sufficient time for questions.
8. Understand that homework often reflects the work of others, i.e., friends and parents.
9. Insure that adequate resources are available for students to complete work.
10. Require all students to complete and turn in all assignments and complete unfinished homework.
11. Notify parents by letter or phone if students do not do the required work.

* * * * *

Cheat!
— Combating Cheating —

Ever since the first caveman climbed up on a rock to teach the fine art of rustling mastodons, some students have been looking for the easy way out—cheating. Although the definition of academic dishonesty varies, it traditionally includes some or all of the following acts:

1. Copying another student's homework or test answers.

2. Using "crib notes" or "cheat sheets" during tests.
3. Having access to teacher answer sheets.
4. Obtaining test questions from students who have already taken tests.
5. Copying themes and other written papers from reference materials.
6. Overuse of parental or sibling assistance with homework or projects.
7. Incorrect grading of assignments and tests in class.

Of course this does not cover the multitude of ingenious, creative ways that students have come up with to beat the system. Regardless of the method, if some action is not taken to stop it, it will become epidemic. There are always techniques to handle students who write answers on hands or stuff paper up their sleeves. First, recognize that some of your children *will* cheat. Remember, schools promote achievement and students want to be successful. Sometimes students may feel pressured to live up to the expectations of parents, peers, and teachers.

Prior to the first quiz, have a talk with your students about cheating. Point out the consequences of doing it. Tell them that cheating destroys the grade curve and actually lowers the grades of honest students. Explain that you need to know if they are learning so you can gear assignments accordingly. Finally, tell them cheating will not be tolerated. This statement of your expectations will do much to head off the problem. Most students will respond well when they are informed of what you intend to do.

In addition, develop standardized test procedures designed to remove opportunities to cheat:

1. Have all books and materials placed on the floor or under the desk during testing.
2. Seat students so it's more difficult to see another student's paper.
3. Move around, stand behind students—but do not sit at your desk.
4. Be sure that students know exactly what to do after the test.
5. Pick up test papers so students can remain seated.
6. Use different forms of the same test if you suspect cheating—color codes are effective.
7. Read test questions out loud to make sure students thoroughly understand all questions before starting a test (this also helps poor readers).

You will be confronted with two different types of problems should cheating occur. The first situation involves suspected or alleged cheating where documentation and evidence are lacking. Be discreet in the way you handle this situation. Never accuse and don't embarrass the student in front of the class. Conduct a private conference and offer the student the opportunity to take a different form of the same test. Oral questioning should also help you to determine whether or not the student was adequately prepared. Above all, don't ignore suspected cases of cheating. Showing concern without accusation or punishment may be sufficient to deter similar situations in the future.

The other type of problem involves open and clear cases of cheating, where there is no doubt that cheating has occurred and you must take some action. Insure that punishment is appropriate. The penalty should not exceed the value of a zero on that test or assignment.

When handling the situation, avoid an open confrontation in front of the entire class. Conduct a private conference with the student. Chronic or severe cases may require referral to a counselor, administrator, or parent, but don't assume that past or future work by this student involves cheating.

Cheating may indicate other problems. Possibly your academic requirements are too high for that student or for the entire class. Perhaps you're not sufficiently preparing your students. In other words, cheating may indicate a need to look further at your method of teaching.

Listed below are a few suggestions which may help eliminate cheating or at least give you a better understanding of the problem:

1. Failing a student, or giving the grade of zero, does not necessarily solve the problem.
2. All students should understand that those who allow copying are just as guilty as those who copy.
3. Nearly all cheating can be eliminated by proper supervision.
4. Easily copied homework assignments should be avoided or graded pass-fail.

Summary of Solutions

1. Never accuse without proof.
2. Do not embarrass a student in front of peers.
3. Use alternative forms of the same test.
4. Conduct private conferences with students.
5. Involve administrators, counselors, and parents in chronic or severe cases.
6. Develop an organizational plan to deter cheating.
7. Move around the room and supervise during the test.
8. Assignments or projects that can be easily copied should not be a major portion of the grade.
9. Use different colored pens when correcting papers in class.

10. Constantly review your expectations regarding cheating with your students.

* * * * *

Are You New Here?
— New Students —

The mobility of American families has increased drastically in recent years. This means that large numbers of students are constantly entering and withdrawing during the regular academic year. This phenomena poses many problems for schools who must orient each new student.

Some common difficulties associated with new entries are:

1. Teacher time is required at the expense of the whole class.
2. Class attention is distracted at the new entry.
3. New students never seem to arrive at predictable or convenient times. For example, the new entry may arrive after the start of a class period which may also be in the middle of a study unit or near the end of a grading period.
4. Most new students are completely out of step with the curriculum. They are not familiar with textbooks and other materials being used in class.
5. New students are not acquainted with classroom procedures and routines.
6. The school building may be a maze for the student.
7. These youngsters are often misplaced in classes because of insufficient information regarding past achievement and ability.
8. They are frequently upset emotionally due to the trauma of leaving their previous schools and friends.

So, how do you react to the new student who just walked into your room with an entry slip? Provide a welcome smile, explain that you will finish the classroom activities presently under way—then start the orientation procedures.

You need to have a handbook explaining classroom routines, practices, and policies for just this eventuality. Give this to the new student and request that he/she read it while waiting. As soon as the lesson permits, quietly explain your routine to him/her. Since procedures will vary from room to room and also class to class, consider the following suggestions and choose those most appropriate to your particular situation.

1. Autobiographies—many teachers have new students write a short personal history during their first day in class. This enables the teacher to become familiar with the new student's background while checking academic achievement and ability through the quality of writing.
2. Allow new students to choose where they would like to sit.
3. Find out if a class member has the same class next period as the new student. Ask this person to show the new student where the room is located.
4. If possible, hold a short after-school conference with new students. This is a good time for the teacher to introduce him/herself in terms of background and expectations.
5. Let the new student know that you are organized. Anticipate new entries by having extra books, book lists, and other instructional materials available.
6. Place a copy of all handouts, assignments, and other material in a folder. Have new students look through this to get a feel for the course.
7. If it is impossible to fit the new student into the present unit of study, you might consider preparing individualized learning/activity packets or modules. This will provide a learning experience while waiting for the next unit to begin.
8. Be careful about introduction of the new student to the entire class. Some new students are embarrassed and feel like "a pet on parade."
9. Know how to pronounce the new student's name correctly. Ask what first name or nickname is preferred.
10. Do not record homework or test grades for one or two weeks. This allows time for the student to adjust to the new situation.
11. Keep in mind that new students are new for more than one day. Adjustment may take several weeks.
12. Be aware of the fact that families may not be completely settled in their new homes. Students may not have proper equipment until family adjustment is completed.

Summary of Solutions

There are a variety of ways to orient a new student. The method you choose should fit your particular subject and students' personalities. Develop a procedure that is both efficient and non-disruptive to your class. Above all, anticipate the new-student problem and have a procedure established.

MOTIVATION MENU

For those days when you can't think of one new idea or one different way to approach learning, here is a list of possibilities teachers at the Wyoming Teachers' Center workshops put together. Add them to your own, adapt, combine—have fun.

Special Awards

Acting
Choices
Posters
Mobiles
Treats
Extracurricular privileges
Pennies
Peer praise
Helper
"Captain's Table"
Gum in class
Make-up test
Certificates
Sunshine notes
Stars
Candy
Good luck charms
Stickers
Names on board
Charts—progress with stars
Good worker awards
Sports as rewards
Additional points
Bulletin awards
Student displays
Student examples
Notes in desk
Honor roll
Ribbon awards
Stamps
Play money or funny money
Erasers
Pencils
Upslips
Special privileges
Success
Free reading
Public recognition of work
Work for eligibility
Snacks, M & M's

Games and Competition

Spelling Monopoly
Jeopardy
Yarn game
Around the world game
Puzzles
Board game
Dot-to-dot puzzles
Relay races/games
Boys against girls
Password
Mop races
Group run
Group competitions
Individual competition
Time-test winner for breaking own record
Language card game
Challenge
Candy bar question
Marbles in a jar
Math race
Spelldown
Intramurals
Language game—"Name the Noun"

Special Activities

Music
Student or teacher profiles
Art projects
  Extra art time
  Clay
  Paint
Open-ended films
Go show to others
Go show to principal
Puppet shows
Role-playing
Plays
Show-and-tell
Recordings or round robin story on tape recorder
Taking turns running equipment
Show "how smart you are"
Leadership role
Mood chart
Popcorn party
Cooking experiment (1 day or 1 week)
Baking
All about me—special friends
Share reading with own class—or with principal
Share with another class guest speaker
Video-tape recording, movies, filmstrips
Student activities
Student doing the teaching
Chains across the room
Treasure box
Make booklet
Vacation time
Party
Helping other teachers

Assignments and Grades

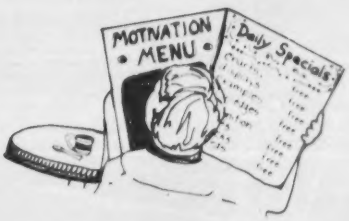
Compilation of assignments
Option to drop grade
Self-evaluation
Extra credit
Point system
Charts—success sheets
Grades
Signed agreements, contracts
Possibility of higher grade
Re-do corrected assignments for ½ more credit

Parents

Call parents
Parent conference with student
Ask mom/dad for information
Phone calls home with good news
Letters and notes to parents
Parent visitation
Parent feedback

Room Arrangements

Guilt corner
Pads
Warm lighting
Pleasant room
Individual desks
Decor



Days/Weeks

V.I.P. of the day/week/month
Student of the week
Worker of the week
Game day

Classroom Management

Brief rules
Free choice
Pleasant, non-threatening environments
Different seating arrangements
Student class rules
Student role in decision-making

Personal Awards

Praise
Touch
Positive comment
Smile
"You look nice"
Enthusiasm
Positive reinforcement
Group reinforcements
Humor
Show affection
Secret pal
Extra credit
Students tape good qualities of other students on back (at least 3)—and student tries to guess

Special Time

Recess or early recess
Free time
Individual conferences with teachers
Administration conference
One-on-one
Visit to principal
Sit by friend
Time together
Free gym
Release time
Snack time
Positive time after school
Rap sessions

Instructional Method

Visual aids
Auditory aids
Written aids
Specific instructions
Flash cards
Set goals
Questions
No distractions
Sequence of events
Student help
Precision teaching
Panels
Individual analysis
Combine drawing with writing (as opposed to only written reports)
Review teams to prepare for tests
Preparedness
Change of activities
Variety of activities
Group work
Student tutor
Student team or partnership (pair) work
Special projects
Field trips
Student input into topic
Introduce new project
Simulations
Discussions
Mini-courses
Video-recording of student projects
Oral book reports

Discipline

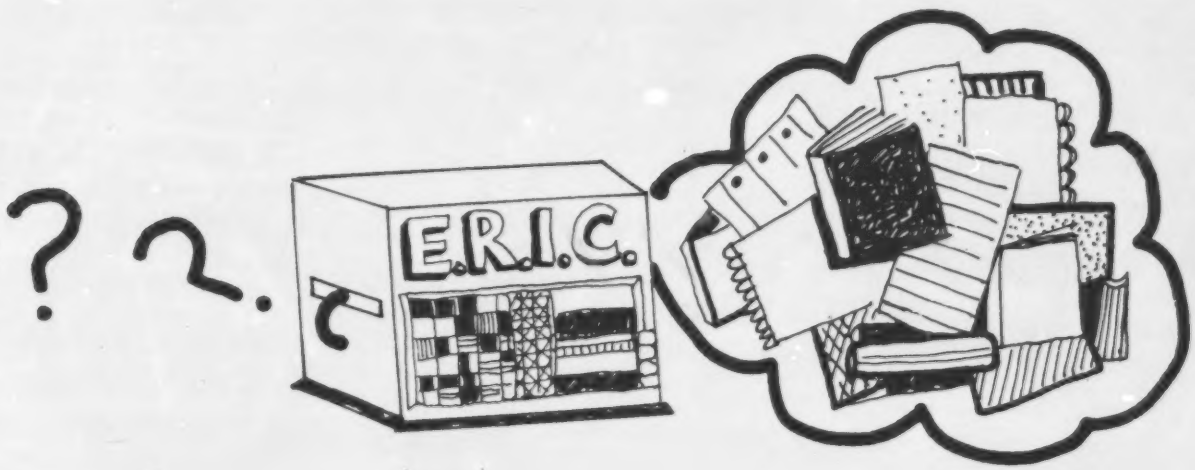
Behavior modification
Negative reinforcement/negative leverage

Cultural and Creative

Foreign Food Festival
Elizabethan Festival
Library time
Field trips to plays, museums, art galleries
Viewing T.V. classes
Finished creative writing display
News broadcast written and recorded by students

ALL YOU HAVE TO DO IS ASK

The ERIC information system can lead you through the maze of education research as fast as you can think of questions, and you can learn to use it in an afternoon



by Henrietta Wexler

Dolores Doright sank down into the faculty lounge couch. "How am I ever going to do right by them?" she sighed.

"Do right by whom, Dolores?" asked Marian Librarian, looking up from her cup of tea and a book.

"Those learning disabled children who're coming into my class next term. How can I find out all I want to know about learning disabilities in such a short time?"

"Why don't you see what ERIC can come up with?" suggested Marian.

"Eric *who*? Oh, you mean the system that keeps track of education documents? I don't have time to mess with that complicated business. It's much more fun browsing through card catalogs—but I don't have time for that either!"

"Tell you what," offered Marian. "Meet me in the media center today after three o'clock and I'll introduce you to ERIC. Once you get to know the system, you'll forget about card catalogs."

"What can I lose?" agreed Dolores. "I'm desperate."

At 3:15 Dolores Doright walked up to Marian behind the checkout counter of the school library and challenged her. "Show me. I warn you, though, I don't take to Buck Rogers gadgets—I don't think I'll ever feel comfortable with them."

"Don't worry," Marian reassured her. "All you have to do is tell me what you're looking for. I'll handle the gadget."

"Well, I want to find out everything I can about learning disabilities."

"Everything? Hold on. If I feed *learning disabilities* into the computer, it'll probably come up with thousands of titles—articles, research reports, books, film. Can we narrow that down?"

Dolores thought a moment.

"Okay. First I need to know how to *identify* a learning disability."

"Fine. *Identification* of learning disabilities." Marian jotted it down. "What else?"

"Then I'd like to know how to deal with learning

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disabled children in a regular classroom."

"Good. *Mainstreaming* of learning disabled children. Anything else?"

"I'm not sure. I'd have to see what's available."

"Come with me to the *Thesaurus of Descriptors*," said Marian, leading the way.

"The *what*? Sounds like a prehistoric monster!"

"*Au contraire*, Dolores. It's a very up-to-date, alphabetic collection of key words and phrases," said Marian as she pulled a volume down from the shelves under the ERIC Collection sign. Let's see. Learning disabilities. There. See the subcategories under it? Some broader, like *handicapped*, some narrower, like *dyslexia*. What do you think?"

"How about *dyslexia*? I expect a few children who've been diagnosed dyslexic."

"Okay. I think those categories will get us a reasonable number of items from the computer. Oh, one more thing. How far back in time shall we go? ERIC's collection began in 1966, and it's got over 400,000 items in the data base. If we don't limit the time frame, we'll be swamped."

"How about the past five years?"

Marian sat down at the computer terminal and tapped a few keys on the keyboard. In seconds, the screen filled up with lines of titles.

"Fantastic!" exclaimed Dolores.

"It tells me there are 39 documents dealing with the three topics we fed into the computer," announced Marian. "Do you want abstracts of all 39?"

"Sure, I think I can manage that—if they're only abstracts. Say how does the computer *do* that—I mean, come up with all that information so quickly? If I'd used the card catalogs, it would have taken hours, maybe days, to find that many resources."

"It's a crossing technique based on Boolean logic principles. If you're familiar with Venn diagrams, you can picture the overlapping categories. But you don't have to understand how the computer is programmed. Just say *please*," Marian laughed.

"Okay, please, how do I get to see the abstracts of those 39 items?"

"There are two ways. One, I can get a printout of the ERIC document *numbers* of the items so you can look them up in the ERIC volumes and read the abstracts here in the library. Or, two, I can order a printout of those abstracts by mail and you can take them home to look over."

"Let's order them by mail so I can take them home. After I decide which full articles I want, what happens?"

"Step this way to our microfiche collection."

"Micro-*what*? Some kind of sardines, ha ha?"

"That's French for tiny memos," explained Marian as she pulled out of a drawer a 4" × 6" clear plastic rectangle with postage-stamp-size blocks imprinted on them. "Now follow me to the microfiche reader. You slip the microfiche into the slot, and presto!" As she turned a knob, the machine's screen displayed, one after another, enlargements of the stamp-sized blocks so each could be read like a printed page. "Now the rest is up to you. You can read each page, take notes, and tell me which pages, or whole documents, you might want on paper."

"How do I get paper copies?"

"This machine will print out whatever pages you want so you can take them home and mark them up to your heart's content."

"Great! How much will that cost?"

"Ten cents a page."

"Sold—a bargain. Can't wait to get the abstracts so I can look them over and choose the ones I want."

"And that's all there is to it, Dolores. *Now* how do you feel about ERIC?"

"You were right, Marian. Browsing through card catalogs may be fun, but I can't afford that luxury any more. Gotta go now. How long will it take to get my abstracts?"

"A couple of days. I'll let you know as soon as the printout arrives."

That scenario, with minor variations, is played out every day in over 500 locations where computer search facilities provide access to the ERIC data base.

What is ERIC?

Education Resources Information Center has been around for 16 years. Some educators know it as a service for scholars and researchers in education. It is that, but far more important, ERIC puts the results of education research into the hands of classroom teachers, students, parents, or anyone with an interest in developments in education.

The nationwide system, supported by the National Institute of Education, consists of a central unit in Washington, D.C., and 16 clearinghouses, each focusing on a specific field of education. Each clearinghouse, with advice from a board of advisors, experts in their field, decides what goes into ERIC's data base. They find about half of the material submitted from a central processing facility and other sources suitable for entry into ERIC's retrieval system.

Resources in Education (RIE) is a monthly publication of abstracts of the nearly 1,400 documents that pass the ERIC clearinghouses' selection criteria. These include "fugitive" documents which might never be seen by educators if not published

in RIE: research reports, curriculum guides and materials, project descriptions, conference papers. The documents themselves are available on microfiche or in print copies for a small charge.

The *Current Index to Journals in Education* (CIJE), another monthly, contains abstracts of articles from over 700 education-related scholarly journals. Although these articles are generally not available on ERIC's microfiche collection because of copyright law, CIJE directs the reader to the source.

In addition to collecting the literature of education for announcement in RIE and CIJE, the ERIC clearinghouses analyze and synthesize the literature into research reviews, bibliographies, state-of-the-art and interpretive studies. These Information Analysis Products are put into the ERIC system and announced in RIE. Many of them are also made available to interested groups through professional associations.

There are about 700 locations in the United States where ERIC microfiche collections are maintained—in many college and university libraries, in most state departments of education, and in more than 60 locations abroad.

What does ERIC cost?

A school library can subscribe to the basic tools of ERIC—the RIE and CIJE series—for as little as $140 a year. (The *Thesaurus of Descriptors* mentioned in the opening dialog, while useful, is not essential.) A microfiche collection costs about $2,000 a year to purchase. But this too, can be done without, since most documents announced in RIE can be ordered by mail in either paper or microfiche. (About 17% are available only on microfiche.)

Computer facilities currently cost about $1,500 a year. The average charge for a computer search like the one described in the opening dialog runs about $25, a charge that many states or school districts will absorb for educators on the staff. The search service, however, is open to anyone willing to pay for it.

Manual searches, while slower, will lead the user to the same information and resources as a computer search.

Who uses ERIC?

Scholars and researchers depend on it. When a graduate student wants to know what's been done by others in the field, ERIC can quickly provide copies of documents produced by fellow researchers.

The Secretary of Education uses it. When the Secretary needs to know everything about a "hot" topic in education, his staffers search ERIC for copies of everything recently published on the subject—pro, con, and neutral.

And of course enterprising teachers and school administrators use it. Especially after school librarians like Marian introduce them to it.

Marian might have been one of 14 school librarians chosen by their state library associations last year to spend a two-week internship in Washington, D.C., learning about the vast storehouses of information housed in the nation's capital. According to Alan Moorehead, chief of NIE's Education Resource Center in Washington, the librarians returned to their home towns filled with evangelical zeal to spread the word about ERIC.

A few ERIC fans

Linda Goolsby, librarian at Rawlins Middle School in Rawlins, Wyoming, was one of those 14 librarian-interns who became ERIC boosters. In Wyoming, Goolsby says, schools can be 100 miles apart and as much as 10 or 20 years behind in education technology and theories. With access to ERIC's data base through the University of Wyoming at Laramie, she has become an experienced ERIC "negotiator" for educators in her school district. (A negotiator helps a searcher narrow the scope and time frame of a quest for information, just as Marian helped Dolores.)

Goolsby recalls one teacher who was trying to cope with an influx of Indochinese and Pakistani newcomers to the district. The material she found through ERIC, on the culture and customs of the children's native countries, helped smooth and hasten the acculturation process for the children.

Goolsby would like to see a much wider use of ERIC. "I've really done some head-scratching about it," she says. "The microfiche equipment in Cheyenne isn't used as much as it would be if the equipment were available in each school district."

While the cost for fuller ERIC service is an obstacle in budget-cutting times, Goolsby continues to invite teachers in her district, through the district newsletter, to get acquainted with ERIC and keep up with the latest education research.

When Jill Leiker, an English teacher in Rifle, Colorado, returned to work after a few years off, she needed to know what was new in her field; so she searched ERIC during the summer before school opened. "I got tons of information—from complete programs to little hints I could use in teaching world literature."

When she searched for new methods for teaching remedial reading in secondary school, she found that her own methods hadn't yet been improved on. But

she did find new reading materials that combined low vocabulary with high interest for teenagers.

In a state as large and relatively unpopulated as Colorado, says Leiker, "ERIC brings the education world to your front door." She, too, feels the system is under-used. One reason may be that too many teachers find it intimidating. "It would help," she believes, "to have instruction in using the microfiche reader." Leiker would also like to see a small portable microfiche reader so inexpensive that teachers could take it home and make paper copies of anything in the system.

Considering the dizzying rate of progress in electronic technology, Leiker's dream does not seem all that impossible.

Another graduate of the 1980 librarian-intern program, Judith Johnson went back to the Central High School library in Rapid City, South Dakota, with a gift subscription to RIE. She promptly set about spreading the news about ERIC not only in her own school but at statewide meetings. Besides writing for a statewide newsletter in order to reach school personnel beyond her library walls, on teacher inservice days each fall, Johnson gives ten-minute "awareness" talks about ERIC.

Using the computer facilities of the South Dakota state library system, she feels challenged to get the answer to any questions that come her way. "If they don't want me to do a whole master's thesis," quips Johnson, "we can get the information." She says searchers particularly find useful the volumes of *Information Analysis Products* published by the ERIC clearinghouses.

Johnson sees to it that literature describing ERIC's services is in plain sight in faculty lounges as well as in her library. She will remind her colleagues that other educators have grappled with the same problems they're confronted with, and chances are they can find workable solutions through ERIC.

James Jess, superintendent of the CAL (Coulter, Alexander, and Latimer) school district in Iowa, calls ERIC a "godsend." He first used the system while working on his doctoral thesis at Drake University.

In 1977, when his small school district was caught between declining enrollments and insufficient funds, 12 parents and four educators (including Jess) met in an Iowa farmhouse to create a voice for a large silent majority. They called their fledgling group PURE—People United For Rural Education.

Seeking "creative management" solutions for his troubled rural schools, Jess turned to ERIC. Through the Clearinghouse on Rural Education, he found out about meetings and conferences where problems of rural schools would be discussed and where he could get other rural educators to join PURE. In three years PURE has grown to nearly 3,000 members nationwide.

According to Jess, 65 percent of the nation's schools are classified as rural, that is, located in communities of 2,500 population or less. Yet these schools are often burdened with regulations designed for large urban schools. Through lobbying efforts of a coalition of groups like PURE, in September 1980 Congress passed the Regulation Flexibility Act, exempting small school districts from having to comply with regulations intended for large ones.

Today Jess, as a member of the advisory board of the ERIC Clearinghouse on Rural Education and Small Schools, not only evaluates material for possible inclusion in ERIC, but helps choose research priorities in the field of rural education.

Julie Lando is in charge of the professional library for the Alexandria City Public Schools on the Virginia side of the Potomac outside Washington, D.C. As assistant to Dale W. Brown, curriculum specialist in libraries and media, she does manual ERIC searches for high officials in the school district; teachers do their own manual searches after a one-on-one session with Lando or after learning how in one of her workshops.

Though she has no computer facilities, Lando does have a microfiche collection. Faculty members can borrow one of her six portable microfiche readers, weighing only two or three pounds, and take it home for a few days to read documents at their leisure. (Some libraries are equipped to make duplicate microfiches for under 25¢ each so people can build up their own microfiche libraries.)

Even without computer facilities (although she feels some day the budget will have to find funds for a computer) Lando believes ERIC is a "fantastic" system for finding valuable information. "Most users," she says, "find far more than they believe is available" on subjects as varied as adolescent suicide, time-on-task, mastery learning, effects of diet on hyperactive children, religion in the schools, therapeutic physical education, early retirement, and peer influence on children's learning.

If you have read this far, you now join thousands of educators who know what ERIC is and what it can do for them. Somewhere within reach of every educator in America is a counterpart of Marian, eager to introduce ERIC to anyone who can be helped by the system. That includes possibly every educator in the country.

WYOMING TEACHERS' CENTER DATA BANK:

Regional Workshops—4 Held In:
Torrington
Rock Springs
Thermopolis
Gillette

Agenda:
The Teacher Advisor/Consultant Role
Wealth Assessment, Testing
How To's for Teacher Consultants
Increasing Academic Learning Time
Discipline, Motivation, Reading

Participants:
170 Educators
37 School Districts
(out of 49 in the
State of Wyoming)

Resource Topics:
Mainstreaming, Stress,
Wyoming Resources,
School Improvement,
Motivation, Discipline,
Parental Education,
Gifted and Talented,
Basic Skills, Child Abuse

Resource Kits Distributed:
200

WYOMING TEACHER CONSULTANTS

"Working through this program as a teacher center consultant has in many ways helped me to become a more effective teacher. I have become more responsive to my fellow teachers' needs and worked toward fulfilling them. All the sessions were essential for my training and I enjoyed them immensely. In becoming more aware of other teachers' needs—I have become more aware of my own."

Big Horn School District #1
Mitchial Lange, Byron High School
Vicki Bjork, Frannie Grade School
Dorothy Dreger, Cowley Elementary
Rita Schetselar, Bryon School

Big Horn School District #2
Patricia Dixon, Lovell Middle School
Tom Dixon, Lovell High School
Judy Schueler, Lovell Elementary

Big Horn School District #3
Lynette Murray, Greybull Middle School
Patsy King, Greybull Elementary
Fran Childers, Greybull High School

Campbell County School District—Gillette
Donna Scott, Westwood School
Robert While, Twin Spruce Junior High
Linda Buus, Twin Spruce Junior High
George Mathes, Wagonwheel School
Carol Skiles, Wagonwheel School
Merrie Borsvold, Rawhide School
Norma Jean Beed, Eastside School
Geraldine Cooper, Little Powder School
Ed Wright, Lakeview School
Francis Jones, Campbell County High School
Judy Worth, Campbell County High School
Barbara Rolfing, Rozet School
Denese Wierzbicki, Cottonwood School
Carolyn Wynn, Hillcrest Sch. ol

Carbon County School District #1
Anne Heeren, Rawlins Middle School

Carbon County School District #2
Kathy Orr, Hanna Elementary
Edgar Reeve, Medicine Bow Elementary
Debora House, Elk Mountain Elementary
Maggie Cason, Medicine Bow/Basin High School
Juanita Williams, Shirley Basin Elementary
Linda Reichert, Saratoga Elementary
John Wickstrom, Saratoga Elementary

Converse County School District #1
Donna Willson, West Douglas Elementary
Pol Holt, Douglas High School

Converse County School District #2
Andrew Heady, Glenrock Middle School
Birney Holberg, Glenrock Middle School
Kathleen Clymer, Glenrock High School
Marjorie Green, Glenrock Elementary

Crook County School District
Maxine Ripley, Sundance Elementary
Timothy Hoard, Sundance High School
Loretta Thomas, Moorcroft School
Ted Parsons, Hulett School
Rosemary Seymour, Moorcroft School

Fremont County School District #1—Lander
Marylou Derby, Westside School
Patsy Bailey, Northside School
Tandy Dout, Northside School

Fremont County School District #2
Eileen Grove, Dubois Elementary
Jane Atchley, Dubois Jr./Sr. High School

Fremont County School District #9
Carol VanDerWege, Jeffrey City Elementary
Linda Lieb, Jeffrey City Jr./Sr. High

Fremont County School District #21
Bill Herzog, Ft. Washakie School
Nancy Zupence, Ft. Washakie School
Nancy Alley, Ft. Washakie School

Fremont County School District #24
Judith Hult, Shoshoni Elementary
Janet Philp, Shoshoni Jr./Sr. High

Fremont County School District #25
Wayne Dennis, Jefferson School, Riverton
Mary Ann Landreth, Jefferson School

Goshen County School District
Simon Lozano, Torrington High School
Randy Adams, Torrington Middle School
Becky Havely, Lincoln Elementary
Debbie Bovee, Lincoln Elementary
Helen Meininger, Pioneer School
Mary Coy, Southeast Elementary
Mary Alice Spray, Southeast School
Lonnie Crow, Lingle/Ft. Laramie High
Peggy Meining, Lingle High School
Virginia Watson, Huntley Elementary
Phyllis Kriese, Ft. Laramie Middle School
Jane Smith, Lingle/Ft. Laramie Elementary
Charlene Campine, LaGrange School
Phyliss Piroutek, Torrington Schools
Judy Lissman, Huntley School

Hot Springs County School District
Margie Blanchard, Hot Springs High School
Iris Gwynn, Witters Elementary
Phyllis Campbell, Thermopolis Middle School

Johnson County School District
Jack Henrickson, Meadowlark School
Karen Walker, Meadowlark School
Bob Myszewski, Buffalo High School
George Grace, Buffalo High School
Mary Schiffer, Kearney School
Cathy Birr, Billy Creek School
Kathy Urruty, Clear Creek School
Kathy Smith, Buffalo Schools

Laramie County School District #1—Cheyenne
Bob Leinius, Central High School
Ron Gray, Cole Elementary

Laramie County School District #2
Connie Barker, Carpenter Elementary
Karen Bryant, Pine Bluffs Elementary
Lorraine Holcomb, Burns High School
Polly Burkhart, Pine Bluffs School

Lincoln County School District #1
Harry Adam, Kemmerer High School
Merle Beebe, Kemmerer Elementary

Lincoln County School District #2
Rand Merritt, Star Valley Junior High
Jerry Mower, Star Valley High School
Sylvia Kolp, Holdaway School
Lloyd Hunsaker, Afton Elementary

Natrona County School District
Ed Gunderson, Casper Schools

Niobrara County School District
Gayleen Percival, Lusk Elementary
Ruth McGee, Cheyenne River School
Joe Tully, Lusk Junior High

Park County School District #1—Powell
Dr. Sally Bell, Park County District #1

Park County School District #6
Dorothy Banks, Cody High School
Mary Houtz, Cody Junior High School
Nancy Bailey, Eastside School
Marlene Groves, Sunset School
Bonnie Imburgia, Livingston School

Platte County School District #1
Joan Branscom, West Elementary School
Debra Ramirez, Libbey Elementary
Maureen Ryff, Wheatland High School
Roxanna Boettcher, Wheatland Junior High

Platte County School District #2
Carol Bartow, Guernsey-Sunrise Elementary
Tim Newton, Guernsey-Sunrise Jr./Sr. High

Sheridan County School District #1
Susan Welzenbach, Tongue River Elementary
Jenny Robison, Tongue River Elementary
Mike Berry, Big Horn Jr./Sr. High
Eugene Scheuerman, Tongue River Jr./Sr. High
Gene Grose, Big Horn Elementary
Mike Chapman, Big Horn Elementary

Sheridan County School District #2
Steve Moose, Linden School
James Isakson, Sheridan High School
Warren Pearson, Sheridan High School
Brooke Moose, Meadowlark School
Kathi Young, Highland Park School
Helen Ryan, Coffeen School
Walt Wragge, Woodland Park School
Natalie Carroll, Woodland Park School
E. R. Shovlain, Sheridan Schools

Sublette County School District #1
Gerald Wilson, Pinedale Schools

Sublette County School District #9
Patricia Quink, Big Piney Elementary
Phillip Quink, Big Piney High School

Sweetwater County School District #1
Bernadine Craft, Rock Springs High School
Sue Magnuson, Desert View School
Bob Faigl, Rock Springs High School
Paul Westberry, Superior School
Larry Regnier, Eden-Farson School
Jean Bonini, Walnut School
Jackie Armstrong, Walnut School
Geraldine Fultz, Desert School
Sharon Weeks, East Junior High
Gale Andrews, Lowell School
Louise Normington, Roosevelt School

Sweetwater County School District #2
Helen Beck, Wilson School, Green River
Maryls Ciscar, Wilson School
Keith Foote, Harrison School
Mary Beery, Roosevelt School
Neil Hudgens, Monroe School
Edwin Makie, Lincoln Junior High

Teton County School District
Jolene Adams, Jackson Hole High School

Uinta County School District #1
Craig Kesselheim, Evanston Middle School
Mary Fickert, Brown School

Uinta County School District #6
Windsor Copley, Lyman Middle School
Allen Jaggi, Lyman High School
Michael Hamblin, Lyman Elementary

Washakie County School District #1
Patricia Wilcox, West Side School
Richard Schoeler, Worland High School
Helen Schoeler, South Side School
Mark Burton, Worland Junior High

Washakie County School District #2
Sandra Francik, Ten Sleep School

Weston County School District #1
Leroy Dummer, Kitty Moats School
Mabel Hinz, Gertrude Burns School
Joe Murphy, Gertrude Burns School
John Schmidt, Newcastle Jr./Sr. High
Betty Shurley, Newcastle High School

Weston County School District #7
Jennifer Silbaugh, Upton Jr./Sr. High
Judy Ludemann, Nelson Elementary

Private Schools
Mary Schadel, Our Savior, Cheyenne
Peggy Selby, Trinity Lutheran, Cheyenne
Elizabeth Lamontagne, Seton, Cheyenne
Stuart Tietz, Trinity Lutheran, Cheyenne

Indian Schools
Sharon Van Griethuysen, St. Stephens